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ESTABLISHED 1872
THE INTERNATIONAL WEEKLY OF THE PAPER AND PULP INDUSTRY AND THE PIONEER PUBLICATION IN ITS FIELD
FIFTY-THIRD YEAR
Published Every Thursday by the
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LESLIE R. PALME' PRESIDENT — GEO. S. MACDONALD VICE-PRESIDENT & TREAS — F. K. HOPPIE SECRETARY
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THIS edition has been thoroughly revised nad brought up to date, it is an accurate and complete guide to the Paper, Pulp, Stationery and Allied Trades bearing on the Paper Industry. Some of the features of this volume are listed herewith.

MILL OFFICIALS—Their connections and official capacities.

PAPER AND PULP MILLS—All mills in the United States, Canada, Cuba, Mexico, South America (geographically arranged). Listing their equipment, total production per 24 hours and products of mills. Approximately 1382 mills are listed.

CLASSIFICATION OF MILLS—Mills manufacturing the same product are listed under a heading descriptive of the product.

PULP, RAG AND PAPER STOCK DEALERS—All concerns dealing in rags, old paper and pulp are listed in this section.

PAPER STOCK AND RAGS CONSUMED—Giving a list of mills that consume these products, the name of the purchasing agent is given for each mill. Also the kind of stock purchased.

PAPER DEALERS—Wholesale paper houses and nature of doin business, either direct from mill, warehouse or through agents. Concerns selling paper as side line included.

CONVERTERS OF PAPER AND MANUFACTURERS OF PAPER SPECIALTIES—This list covers manufacturers of paper for special uses, some of the products being glazed, coated, waxed and parchment papers; paper bags, boxes and tags, also envelopes, pads, tablets, wallpapers, toilet papers, etc. A list of Twine manufacturers is included.

WHOLESALE AND RETAIL STATIONERS—Leading stationers and concerns handling stationery in the United States, Canada, Cuba and Porto Rico. This list si very complete and accurate. 17,887 concerns are listed.

WATERMARKS AND BRANDS—All the leading titles in the American Paper Trade are included.

TRADE ASSOCIATIONS, STATISTICAL INFORMATION AND ADVERTISEMENTS—Names nd aaddresses of 132 associations are given. Sources of supply for machinery and raw materials are included in the advertising section.

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LOCKWOOD TRADE JOURNAL CO., Inc., 10 East 39th Street, New York, N. Y.

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PAPER TRADE JOURNAL

With Which Is Combined

PAPER

Vol. LXXXI. No. 4 — Thursday, July 23, 1925

The Magazine of the Paper Industry

Rumors of Paper Mill Mergers Rampant in Montreal

Much Talk Regarding Plan to Bring Together a Number of Canadian News Print Mills—George M. McKee to Assume Presidency of Port Alfred Pulp & Paper Corp.—Wayagamack Mill to Start Production of Paper in November—Plans Considered for New Paper Mill for Winnipeg—U. S. Interests May Erect Paper Mill

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., July 20th, 1925.—The air here is full of talk about mergers of paper mills. There is a rumor, for instance, that the New York house of Dillon, Read & Co. is now taking up the question of bringing together a number of the Canadian news print mills, and it is conjectured that the mills affected will be those in the Valley of the St. Maurice, notably Laurentide, Belgo, St. Lawrence and St. Maurice. Then again a Chicago finncial house is stated to be progressing with plans for bringing the Spanish River and Abitibi Paper mills into a combination. Still another rumor is that well-known Montreal and Toronto financial interests are in a move to bring together the Laurentide and Belgo-Canadian properties. In connection with the latter rumor, the following tabulation of statistics regarding the two companies has been put forth:

	Belgo	Laurintide
Bonds	$ 8,000,000	
Pfd. Stock	4,000,000	
Com. Stock	8,500,000	$28,800,000
Total	$20,500,000	$28,800,000
Total Assets	$25,460,337	$35,736,428
Properties, etc.	20,192,978	24,094,876
Current Assets	5,140,199	11,484,246
Current Liab.	1,944,457	4,592,103
Working Cap.	3,195,742	6,902,143
An. Prod. tons	115,000	115,000
Owned, acres	15,000	41,274
Leased sq. miles	1,728	3,220

Has Showed Profit for 21 Years

The business of the Belgo Company was established at the beginning of the present century, and operated for about 23 years under Belgium ownership. Under its former owners the company showed a profit during the past 21 years of operation. Output increased gradually, and at the time of the transfer of control, was approximately 90,000 tons per annum. Under its Canadian owners the business has further increased to 115,000 tons per annum and earnings have increased proportionately.

The Laurentide Company have a valuable asset in the Laurentide Power, as $7,200,000 of the capital stock of the latter company is owned by the parent company and is carried on the books of the company, at a figure much less than either the intrinsic or market value of the shares. The shareholders of the Laurentide Company would stand to benefit handsomely by a merger, as the company is in strong financial position and there is no security senior to the common stock. This company is ably managed.

Port Alfred Pulp & Paper Corporation

George M. McKee, now the president of the Algonquin Paper Company of Ogdensburg, N. Y., is returning to Canada to assume the presidency of the Port Alfred Pulp and Paper Corporation, of which he will become the active executive head. His appointment was ratified at the annual meeting of the corporation held in Montreal a day or so ago. Mr. McKee has been associated with the Canadian pulp and paper industry since 1912, his connection with the industry commencing with his organization of Donnacona Paper Company, of which he remained managing director until 1922. During Mr. McKee's regime, the Donnacona mill was constructed and its valuable timber rights on the Jacques Cartier River were obtained. Under his guidance, Donnacona Paper Company became noted for its low cost of production. Mr. McKee was recognized by the Canadian Pulp and Paper Association by his election as vice-president in 1921, and as president in 1922. His term in the latter office, however, was cut short by his departure for Ogdensburg for the organization of the Algonquin Paper Company, of which he is president. Mr. McKee's paper experience dates back to the nineties. In 1897 he entered the employ of the Friend Paper Company at West Carrollton, Ohio, and in the interests of that company became identified in the following year with the Hinckley Fibre Company, in which Mr. McKee served in capacity first as general manager and later as president. Mr. McKee remained with Hinckley Fibre Company until the commencement of his activities in Canada with the Donnacona Paper Company in 1914. Mr. McKee is a graduate of Pennsylvania State College, in which he took his degree in electrical engineering. It is understood that Mr. McKee will actively direct the operations of the Port Alfred Corporation.

To Start Production in November

The news print mill now being constructed by the Wayagamack Pulp and Paper Company at Three Rivers, Que., is expected to start production early in November. Structural materials for the three buildings have been received from England. Work on the foundations is stated to be about completed and now, every effort is being concentrated upon the news print plant proper. This will be completed within the next couple of weeks when the work of installing the machinery, which was received from England, will be started.

As adjuncts to the news print mill there will be a mechanical

pulp building and a finishing building. These will also be well in hand by the end of October, ready to take care of production. It is stated that the company's general cost position will be a very favorable one, once the news print bill gets under way. It is understood that through the distribution of overhead, the production cost of the kraft mill will be reduced by some $200,000 annually; that the selling costs will also be substantially lowered; and that the present organization, which is well established in all leading markets, will be able to dispose of the news print output.

Another Paper Mill for Winnipeg

Assurances that they were prepared to go ahead immediately with the construction of a $5,000,000 paper mill of 250 tons capacity in the greater Winnipeg district, provided the Dominion Government entered into a contract providing pulpwood and water rights, were made last week by George M. Seaman, of the Seaman Paper Company, Chicago, and E. W. Backus, of the Backus-Brooks interests in Canada and the United States. "My only intention is to build as quickly as possible a 250-ton mill that will not manufacture pulpwood for sale but will manufacture news print entirely," said Mr. Seaman, while Mr. Backus declared: "Mr. Seaman has committed himself to erect in greater Winnipeg a mill, and I am going to stick by him in that determination." Pulpwood manufacture in Manitoba is complicated by rival manufacturing interests, since the Government has just granted the Spanish River Company a thousand square mile timber berth for a hundred ton mill in Manitoba.

Chicago Interests Starting New Mill

Work will be started in a few days at Manicouagan, Que., on the north shore of the St. Lawrence, by the Ontario Pulp and Paper Company, on a huge water development, which is preliminary to the construction of a paper mill to be operated by the company. In November, 1923, the Ontario Paper Company leased from the Quebec Government a large area of timber limits, located along the Manicouagan River and also at the same time obtained the right to develop the water powers on the Manicouagan River to allow its operations to be conducted. A few weeks ago it is understood that the final arrangements in this connection were complete and the work will be started without delay.

U. S. Interests May Erect Paper Mill

Certain Chicago financial interests, comprising among others, Cyrus and Harold McCormick, principals in the International Harvester Company, have recently completed a two weeks' cruise through the timber holdings of the Beaver Cove Lumber and Pulp Company, on Vancouver Island. The report has been made that the survey was undertaken with the purpose in view of spending about $10,000,000 in the erection of a modern paper mill on the property, the conversion of the old Kraft and Pulp Mill to sulphite and the harnessing of a big water fall on the Nimpkish river that will provide sufficient power for the entire plant.

What Paper Mill Means to Railroad

The "Broke Hustler," the local paper published by the Abitibi Power and Paper Company at Iroquois Falls, says: "Counting a 365-day year the number of cars handled in and out of the Abitibi mill was 28,994 which does not include miscellaneous way freight to the mill, cars to the Abitibi Lands and Forests or Iroquois Falls Merchandising Company, which would add somewhat to the figure. This means eighty cars a day every day for a year."

Water Power Development

Rapid progress is being made in Quebec and other provinces of the Dominion in harnessing water powers and the rapid expansion of this work in recent years has placed Canada amongst the foremost nations of the world in the matter of developed hydro power. Within the last four years there has been a 40 per cent increase in water power production in Quebec; than 50 per cent in Ontario and 25 per cent in British Columbia. The present development is equivalent to that which would be secured from three hundred million dollars' worth of coal in a year.

Damming Lake Kenogami

The Quebec Streams Commission will have completed its work of damming Lake Kenogami by the Fall, it was announced, when the huge reservoir will be completely finished. Already it is estimated that twelve million cubic feet of water are stored there, and it is estimated that this figure will be considerably surpassed when the work is all finished.

Pigeon Timber Co. Busy with Pulpwood

PORT ARTHUR, Ont., July 20, 1925.—The Pigeon Timber Company has at present six camps installed, employing approximately four hundred men, who are peeling spruce pulpwood, and averaging about 375 cords per day. It is expected to have between 1,200 and 1,500 cords of peeled pulpwood ready for next year's market. Should the market be attractive, the company will likely produce an additional thirty-five thousand cords of rough spruce pulpwood.

This peeling undertaking of the Pigeon Timber Company is entirely new in this district. It is said, however, already to be a success in every particular and it is expected that the district will this year produce a very large quantity of peeled pulpwood.

Last year the price of wood in this District was very low, which resulted in a production of about seventy thousand cords less than the year before. This year, because the mills bought very sparingly last year, a much better market is looked for.

The big difficulty in peeling was the comparative inexperience of the company's woodsmen. Its labor turn-over was very high, but now it finds that the men are well satisfied and that the bark is slipping excellently. From present appearances, the company will be able to peel until about August 10.

Graff Addition Nearly Completed

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., July 20, 1925.—The large addition to the warehouse owned by D. Graff and Sons, and located south of the Michigan Central right of way and in East Willard street, is nearly completed and will be ready for occupancy this month. It is entirely enclosed and windows have been put in. It is connected with the original building by open archways and sliding fireproof doors. The four stories will add about 10,000 square feet of floor space to the area of this one unit. There will be a siding leading direct to the structure.

The additional space is badly needed. Despite the immense capacity of the two warehouses operated, the business of this concern is showing a remarkable growth. Paper stock of all grades is shipped to Kalamazoo from points in Michigan and Indiana and sorted and graded here. Practically the entire output of this concern is sold to mills in the Kalamazoo valley.

Bemis Bro. Bag Co. to Make Bags at Wichita

WICHITA, Kans., July 20, 1925.—What is in reality a new industry for Wichita is to be installed by the Bag Company, at its plant at Wabash and Thirteenth, involving a cost of $25,000 to $30,000, with a corresponding increase in the company payroll.

Machinery for the manufacture of paper bags has been ordered and additional printing equipment for the plant, according to W. H. Mensendick, local manager. The plant will probably be ready to begin the manufacture of paper bags by the first of October.

Paper for the bags is manufactured in the company's plant at Peoria, Ill.

The Bemis Company also manufactures cotton and jute bags for flour and grain. The cotton is manufactured in the company's own mills in this country and the jute in mills in India, also owned by the company.

Price Cutting Follows Dull Business in Toronto

Hon. James Lyons Tells of Discovery of Large Deposits of China Clay—Kaministiquia Power Co. Involved in Heavy Litigation—Lincoln Pulp & Paper Co. Acquires Assets of Lincoln Mills—Pulp and Paper Mills Show Great Interest in Safety Work—Trade Notes and Jottings

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., July 20, 1925.—Business in the pulp and paper line is jogging along about the same as it has for the past month. Due to the general dullness, it is stated there has been some tendency toward price cutting and every effort is being made by distributors to keep quotations on the various lines at the figures which have been prevailing for some time. There are some features of the trade which are out of the ordinary. The Provincial Paper Mills, Toronto, last week shipped to New Zealand and Australia ten car loads of book and writing paper. This is one of the benefits of the favorable trade treaty which has been entered into between Canada and Australia and the firm believes that good results will follow the initial consignment. The stock came from the Port Arthur plant of the company which will ship all its surplus to the Antipodes in preference to the market across the line. The company has just started an extensive mail order campaign, featuring "Oxford" book, both machine finish and supercalendered, which has been turned out for a number of years.

There is a very good demand for all grades of rags, although no great quantity is in sight from the collection standpoint. The call for waste paper by the mills is very light. Board is in moderate demand and plants are running on the whole to about seventy-five per cent capacity. Paper box factories are still quiet but strong hopes are entertained of an early improvement.

Much China Clay for Paper Mills

Hon. James Lyons, Minister of Lands and Forests for Ontario, recently returned from an extended trip to the northern part of the province, making most of the journey by aeroplane. He made an aerial cruise of the Moose Factory—James Bay district, which carried him over 1,300 miles without mishap. Mr. Lyons described the recent discovery of the large deposits in the far north of china clay, which is used extensively in the production of coated paper, as one of the greatest commercial finds ever struck in the province.

The purpose of the flight was to enable the minister to form a firsthand opinion of the timber and pulpwood limits in this district which have recently been advertised for sale, to form some opinion of the possible waterpower developments, and to investigate any other commercial possibilities that might come to light.

The minister was most enthusiastic over the future of that vast country, pointing out that the biggest difficulty was one of transportation. "If the areas we have advertised for sale are disposed of several important power developments are likely to be carried out in the near future," he said. "We have estimated the horsepower of the many falls and they rank high, but the actual figure cannot be given yet. To properly harness this power, however, and to haul out the timber, rail connections must be obtained. The limits now for sale are about 60 miles from the C.N.R., and as the rivers all flow north into Hudson or James Bay, the wood must be hauled out. This will necessitate a logging road or railroad."

Big Claim Against Power Company

The Kaministiquia Power Company is facing a heavy litigation in an action now before the Ontario courts on behalf of John Stirrett & Sons, Limited, lumbermen, of Port Arthur, Ont. The latter concern claim heavy damages due to deprivation of water for several seasons, thus preventing them from being able to float out their winter's cut of logs. They also ask for an injunction to restrain "Kam" Power from using as much water as they have been and compelling them to keep to the letter of the agreement with the Hydro-Electric, under which they claim to operate the dam controlling the waters of Dog Lake. The present action, which is for between $400,000 and $500,000, will be watched with considerable interest for if the "Kam" Power win the case, it means that no lumbering concern can economically and successfully operate in the district, whilst if John Stirrett & Sons are successful in their action, the power production of "Kam" Power will be seriously affected and grave questions would be involved covering the title of the company to its power.

Paper Mills Use Many Cars

A large paper mill means much to a community, not only in building it up but establishing a local market and providing business for the railways. The Abitibi Power and Paper Company, Iroquois Falls, Ont., reports that the number of cars going in and out of the mill at that point during the past year was over 80 a day which did not include miscellaneous way freight to the mill, cars to the Abitibi Lands and Forests Company, Limited, or Iroquois Falls Merchandising Company, which would add something to the figure.

Lincoln Pulp and Paper Co.

The Lincoln Pulp and Paper Company, Limited, has acquired all the assets of the Lincoln Mills, Merritton, Ont., and ample working capital has been secured to carry on the business in all its departments. The plant and equipment belonging to the company is now in first class condition and the properties operated include the sulphite mill, the Lybster paper mill, the Lincoln paper mill and the Lincoln flour sack mill, all located in Merritton, together with a sawmill at Maria, Que., and a pulp wood plant at New Carlisle, Que., as well as timber limits consisting of 281 square miles in the Gaspe peninsula, Que. The directors of the company are: R. Home Smith, Toronto, President; Dr. T. A. Woodruff and H. H. Collier, Vice Presidents; Hon. William A. Smith and R. A. Stinson, President of the English Electric Co. of Canada. K. S. Maclachlan, B.A. Sc. has been appointed general manager with office at Merritton, while A. G. Natwick, general superintendent, will be in charge of operations of the combined plants at Merritton. George C. Winslow, of Toronto, will control the sales of paper and flour sacks and Mead, Patton & Co., Inc., 366 Madison Ave., New York City, have been retained in charge of the distribution of pulp. The lumber and pulpwood operations and sales will be supervised by E. B. Reid, B. Sc. the woods manager.

Great Interest in Safety Work

A. P. Costigane, Secretary-Engineer of the Ontario Pulp and Paper Makers' Safety Association, Toronto, spent last week visiting the pulp and paper mills at Fort William, Port Arthur, Sault Ste. Marie, Nipigon and other places. The plants were all found to be in good shape and a general improvement was noticed in the "good housekeeping" of the mills. Mr. Costigane states that bad housekeeping is now recognized as one of the most prolific causes of mishaps and greater attention has been directed along the line of accident prevention than ever. Comparing the accident record of most of the mills visited by Mr. Costigane this year with the same period of 1924, a considerable improvement is evidenced and, should this condition continue until the close of 1925, it bids fair to greatly surpass any previous showing in Ontario. The question of including woods operations with the scope of the activities of the Ontario Pulp and Paper Makers' Safety Association was discussed with the companies and all the firms, interested in woods operations, expressed themselves as anxious to see the work taken up as they are conscious of a big leakage in the camps due to the inadequate care of minor injuries at the time of their occurrence.

Organized Effort in the Paper Industry

Assistant Secretary O. M. Porter of the American Paper and Pulp Association, was a speaker last night, at a largely attended and very interesting gathering of the York, Pa., Rotary Club. The attendance included representatives of many mills in that section. Mr. Porter spoke on "Organized Effort in The Paper Industry." His talk follows:—

Changing Conditions

"The old order changeth giving place to new."

Business is being carried on differently now than it has been in the past. The *unit* production has given way to *volume* production. Great industrial establishments have been built up for mass production. This has been possible only as the result of progress in the development of communication and transportation facilities. These are changes which are going on from day to day. One result (which is felt in every pulp and paper mill) of the improvement in transportation conditions is the extent that the manufacturers now must store their goods since the distributors and the consumers have realized that their orders can be filled within a reasonable length of time, and they are no longer accumulating great supplies of raw materials or finished products as insurance against individual transportation delays.

Sensible Co-operation

These changes have all brought changes in the average business man's relation with his associates and competitors. We are approaching an era of sensible co-operation. Men are able to do more now, working harmoniously together, than was possible even under the forced pressure of war. Business men acting together, reasonably and constructively, are now in a position to develop information, statistics, Credit Bureau Service, mutual insurance, foreign trade, etc., as has never heretofore been possible even when the individual felt the real or implied pressure of Governmental authority in its general activities for the people. Business itself is now being done more and more out in the open and not behind closed doors. An example of this, with which every business man is familiar, is the modern practice of placing bank officials where they can be seen and can be gotten at by the public.

Business and the Government

The Government itself is taking a constructive interest in business as never before. Perhaps too much so, but nevertheless the facilities, the personnel and its contacts of our Government business forms unlimited opportunities for assistance to the individual. Examples of this are the Departments of Agriculture and Commerce, with their County Agents, Federal Forest Service, Forest Products Laboratory, Bureau of Foreign and Domestic Commerce, commercial attaches, etc. The County Agent is bringing to the individual farmer the accumulated knowledge and experience of technical investigations of many men and many institutions the world over. Most of this information may be had almost for the asking. The same is true of the Federal Forest Service, under whose active, intelligent, constructive administration not less than a hundred and sixty million acres of productive forest land are being managed on a basis of sustained yield for the greatest good of the greatest number of citizens of the U. S.

The Forest Products Laboratory at Madison, Wis., is a Government institution working hand and glove with the wood using industries of the country in an effort to develop new uses, new processes—to reduce unnecessary waste and loss, and to increase the efficiency of manufacture and ultimate distribution.

Necessity for Organized Effort

All this revolves itself into a necessity for organized effort. The individual is impotent, the group is powerful. You remember the story of the fagots—how it was impossible to break the bundle, but separated into its component parts, the individual sticks were easily broken and destroyed. The same is true in industrial activity. Industries must present a united front in this period of keen competition, possible only through organization, co-operation. The paper industry is one of many great national industries with a central organization, working at all times in the interest of the industry, for its protection, promotion and perpetuation.

The American Paper and Pulp Association as now organized, is ready and able to give specific, direct service to its individual members, and to the industry as a whole. That is possible only because the Association, after a varied career extending over almost half a century, has now been placed on an bsolutely sound financial basis with direct membership, responsibilities, and opportunities for worth while returns to individual mills. It is ably led, the Association's Executive Committee consisting of:

Norman Wilson, Hammermill Paper Co.; Alex. Gilman, Allied Paper Mills; D. C. Everest, Marathon Paper Co.; H. J. Chisholm, Oxford Paper Co.; E. Elsas, Continental; Philip Weston, Bryon Weston Co.; Frank Sensenbrenner, Kimberly-Clark Co.; W. L. Carter, Nashua.

This Committee is a group of broad gauged men, men who have made themselves and who are making history in the industry, and it is they who are guiding and directing its policies and affairs.

The Association as never before is presenting a united front in its representation of the industry, and that is absolutely essential. Take for example the matter of legislation, beneficial or harmful, as the case may be; the industry through its Association must follow the situation at Washington and it must be in a position to they adversely affecting the paper industry as a whole, or any specimake constructive recommendations in matters of general importance. An example of this are the present postal rates. Are fic group in the industry? If so, how, and to what extent, and how can the industry best lend its support to movements which are working for the development of a sound postal service, wherein each class of goods pays its own way, stands on its own feet and the service itself develops on the sound basis of individual returns for individual efforts.

The Association realizes this opportunity and is endeavoring to determine the effect of these new postal rates on the industry. This is done by means of reports from the individual mills which are classified by the group conclusions presented to the Executive Committee and constructive recommendations laid before the membership of the Association for action.

It is becoming increasingly clear, it must be increasingly clear to every manufacturer and converter of pulp and paper in the United States, that our complex business and political conditions make it impossible for the indivdual business man or the individual mill to succeed alone. The situation today demands co-operative action, joint action, common sense co-operation. Every mill now a member of the Association, and each of our affiliated organizations must recognize the value and importance of organized effort, and must develop individual faith in organized effort, even to such an extent that the time will come when the Association actually represents the *entire* industry, and through its facilities, its organization service, the individual mill and the industry as a whole as only a representative organization can serve the industry.

Fields of Service

It might not be out of place at this time, before a group of businessman and in a region in which paper is being manufactured and sold in large quantities, to put out some of the fields of service of the American Paper and Pulp Association as an organization responsible in a measure at least for the larger general problems of the pper industry.

First among these comes the Association's opportunities to repre-

MATHIESON Chemicals

Mathieson Aqua Ammonia as a Casein Solvent

MANY manufacturers of high-grade coated papers have learned the advantages of Aqua Ammonia as a solvent for casein.

Aqua Ammonia is a superior solvent for this purpose due to the fact that it is readily volatilized by heat. When the paper, impregnated with a solution of casein in ammonia, passes over the drying rolls, the ammonia is driven off. Only the casein—no solvent—remains in the paper.

Mathieson Aqua Ammonia, 26°, is a product of exceptional quality made by our synthetic process from highly purified nitrogen and hydrogen gases. It is shipped in standard 110 gal. drums from our Niagara Falls plant or from warehouse stocks in principal cities.

We solicit inquiries from all Paper Mills using casein.

The MATHIESON ALKALI WORKS Inc.
250 PARK AVE. NEW YORK CITY
PHILADELPHIA CHICAGO PROVIDENCE CHARLOTTE

Caustic Soda ~ Liquid Chlorine
Bicarbonate of Soda
Anhydrous Ammonia

EAGLE THISTLE PRODUCTS

Soda Ash ~ Bleaching Powder
Modified Virginia Soda
Aqua Ammonia

Deal Direct with the Manufacturer

sent the industry at Washington and elsewhere. A year or two ago Secretary Hoover, speaking to a group of paper manufacturers who happened to be before him, stated that the trouble with the paper industry was that it did not present a united front, that groups of manufacturers with apparently conflicting interests urged their individual points of view at Washington rather than present the needs of the entire industry through the Association in which the minor difficulties of the individuals or groups had been smoothed out and recommendations were such as would result in the ultimate welfare of the whole industry.

The best example of the Association's representation of the industry as a whole is illustrated by its activities in the development of a reasonable tariff, etc.

1—Representing the Industry.
2—Information—clearing house.
3—Direct service to mills.
4—Emergency service—tariff, casein, clay, pulpwood embargo, etc.
5—Raw materials—forestry.
6—Arbitration—credits, costs, etc.
7—Technical information—sales data.
8—Statistics.

Opportunities for further service.

1—Research.
2—Tax expert.
3—Traffic.
4—Foreign Trade.
5—Distribution and new markets.

Trade Association and Law

During the past few years trade associations have been very much in the public press. As a result trade organizations, working honestly and constructively for the welfare of their industry, have been handicapped by a lack of certainty, a knowledge of what the Government expected, or approved, or frowned on in the way of legitimate trade association activities. The recent decision of the U. S. Supreme Court in the Maple Flooring and Cement cases has materially cleared the atmosphere. No new principle of law has been inunciated but the Supreme Court has said definitely that certain trade association activities were legal, if they were not carried to such an extent that they resulted in the control of prices, the division of territory or the limitation of production, etc.

This decision has given the trade associations courage to carry on in the interest of their members, and for the good of the industries which they represent. Our own activities are carefully scrutinized by Mr. Henry C. Wise, an authority on trade associations and the Law. Under his guidance it will be impossible for us to transgress even the spirit of the law—and yet as a group of intelligent business men we may collect and meet and discuss statistics essential to the legitimate conduct of our business.

Bids for Government Paper

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 22, 1925.—The Government Printing Office has received the following bids for 10,250 pounds of 17 x 28 inch 20½—No. 16 white glazed bond paper: Aetna Paper Company, 16.42 cents; Old Dominion Paper Company, 17.98 cents; Maurice O'Meara Company, 22 cents; R. P. Andrews Paper Company, 16.75 cents; American Writing Paper Company, 17.74 cents; Barton, Duer and Koch Paper Company, 15.45 cents; Whitaker Paper Company, 15.71 cents; Dobler and Mudge, 16.23 cents; Reese and Reese, 20.87 cents; Barton Hobart Paper Company, 20.5 cents; and Import Paper Company, 17.5 cents.

The Printing Office will receive bids on July 24 for 9,450 pounds (300 reams) of 24 x 38 inch 31½—No. 13, white bond paper.

To Acquire Whitmore Mfg. Co.

[FROM OUR REGULAR CORRESPONDENT]

HOLYOKE, Mass., July 21, 1925.—Negotiations are underway for the transfer of the Whitmore Manufacturing Company to the Rosmarg Coated Paper Company, newly organized concern of Holyoke paper men. The offer was made in a communication by John J. White, who is treasurer and general manager of the Whitmore Company, to Russell L. Davenport, receiver of the concern. Upon the petition of attorney Davenport all creditors of the company and all claimants to any of its assets are notified of the petition in relation to the sale of the property so that they may appear at the First Equity Division sitting at Boston on August 6, and show cause, if any, why the petition should not be granted.

The property of the Whitmore Company includes the land, buildings, machinery, equipment, good will, trade names, and in general all of the property of the company. There is to be excluded from the sale, cash on hand, and the accounts receivable. The receiver is to pay all accounts payable incurred by him as receiver and in addition the following merchandise and materials are to be excluded: Casein, satin white, blanc fixe, clay and any and all colors, any raw stock of paper in rolls or sheets, any finished stock in rolls or in sheets, or in process, any finished stock sealed or in cases or on hand in any other manner. The receiver is to complete any orders which are in process of manufacture at the date of passing of papers, all expenses attached thereto to be paid by him, and he is to bill the same and collect the proceeds as receiver.

The Rosmarg Coated Paper Company agrees to pay to the receiver a fair market value for any of the stocks or materials not included in the sale which it desires to purchase, but does not bind itself to purchase said stocks or materials. The Rosmarg Coated Paper Company is to pay the sum of $15,000.00 and is to assume the taxes and any interest due thereon at the date of passing of papers.

Payment is to be made by said Rosmarg Coated Paper Company assuming the mortgage of $100,000.00 on the property held by the Holyoke Savings Bank, and any interest thereon due at the time of passing of papers, and by paying $50,000.00 in cash, and assuming the taxes and interest thereon.

Payment is to be made ninety days after the acceptance of this proposition by the receiver, and the approval and authorization thereof by the Superior Court of Hampden County, Massachusetts, or within such shorter period after such approval and authorization as may mutually be agreed upon between the Rosmarg Coated Paper Company and the receiver.

"Training Key Men in Industry"

Training foremen is the subject of the latest report published by the Metropolitan Life Insurance Company's Policyholders' Service Bureau.

Few foremen appreciate what important factors they are in the lives of those whom they supervise. The report shows how foremen can make a day fruitful or barren.

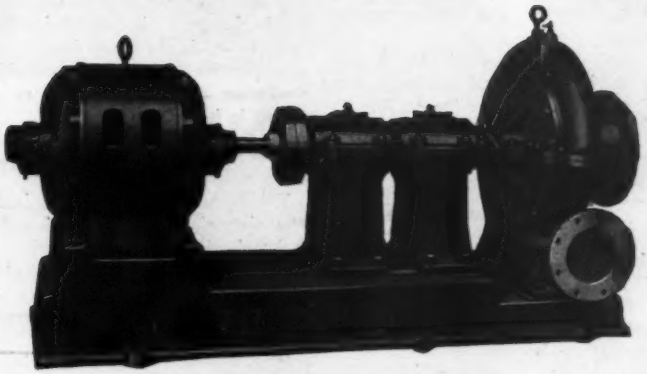
The report deals with foremen as the key men or link between management and employees. Their part in reducing labor turnover—promoting and maintaining co-operation of men,—cutting costs,—and eliminating waste,—is emphasized! There is much to be gained by training foremen to do these things,—gains for the workers and gains for the management.

The report outlines subjects recognized as valuable for foremen training and gives a description of the best methods of teaching them. The foremen training practices of nine nationally known companies are described.

Copies may be secured, without obligation, by writing to the Policyholders' Service Bureau, Metropolitan Life Insurance Company, New York.

Ask for "Training Key Men in Industry."

FREDERICK PUMPS



ONCE - - - - - ALWAYS

In the spring of 1919 one of the largest paper companies in the United States bought an 8″ Frederick stock pump.

Since this time this one company has purchased over sixty pumps ranging in size from 4″ discharge up to and including 16″ discharge.

These pumps are performing all types of service and are handling stock ranging from white water to 5% consistency.

At the present time an order is going through our shop for sixteen pumps for the same concern. This continued patronage is appreciated by us and we feel that it is a compliment to the merits of Frederick pumps.

The Frederick Iron and Steel Company

FREDERICK, MARYLAND

In Canada—DOMINION ENGINEERING WORKS, LTD., Lachine, Que.

Obituary

John Gibson, Jr.

John Gibson, Jr., president of the Wrenn Paper Mills and vice-president of the First and Merchants' Bank of Hamilton, whose death was briefly reported in THE PAPER TTADE JOURNAL last week, was 48 years of age. His death came unexpectedly at his home, in Middletown, Ohio, following an operation.

Mr. Gibson was widely known for his paper mill association, and was a member of the Miami Valley Hunt and Polo Club, the Butler County Club, the Elks, and of the Church of the Ascension.

He had been in ill health for several years and in a serious condition recently. He submitted to an operation in Cincinnati and was immediately taken to his home. Family and friends were much heartened by his apparent improvement and apparently he was rallying from the shock in good shape. The sudden turn in his condition and his death came as a shock.

He is survived by his widow, Mrs. Martha Pollard Gibson, and a son, John Timberlake Gibson, 12. The funeral services were conducted Friday, July 10, at 5 p. m. from his residence, 715 S. Main street. The Rev. Thomas Williamson, rector of the Church of the Ascension, had charge of the services and burial was in Woodside Cemetery.

George B. Hurd

George Browne Hurd, well known manufacturer of papetries, died at his home in Elberon, N. J., after an illness of more than a year. Mr. Hurd was 72 years old and maintained a city residence at 47 East Fifty-first stret. He is survived by his wife, formerly Miss Florence Huntoon, and a son.

Funeral services were held Tuesday afternoon at 2 o'clock in St. Thomas' Church, Fifth avenue and Fifty-third stret.

Moosehead Paper Mill Burns

[FROM OUR REGULAR CORRESPONDENT.]

SKOWHEGAN, Me., July 20, 1925.—Fire of an unknown origin recently destroyed the mill of the Moosehead Paper Company, with a loss estimated to be about $160,000. A chief's call was sounded at eight o'clock at night, the company responding quickly. The flames were shooting high and the entire center of the mill was ablaze. An alarm was then sounded to which the entire department answered, but the fire was beyond control and the building burned to the ground.

When discovered the fire was in the center of the mill on the first floor on the side facing the railroad tracks. It was reported that two explosions in rapid succession were heard previous to the breaking out of the blaze.

Although not in operation since purchased by the Moosehead Company last spring, the mill, when working, employed nearly 50 persons. It was formerly owned by the Savage Manufacturing Company, of which E. L. Savage of Skowhegan was a member. It was located on the site of the old Lyons Paper Company, which was run by R. E. Lyons over 40 years ago.

D. H. Wood Elected to Presidency

[FROM OUR REGULAR CORRESPONDENT.]

CHATTANOOGA, Tenn., July 20, 1925.—D. Hewitt Wood, president of the Converse Bridge and Steel Company, was elected president of the Southern Cotton and Paper Company at a meeting of the stockholders and board of directors recently. Mr. Wood succeeds Mercer Reynolds, who organized the company and worked out the process of manufacturing paper from coton linters.

Mr. Reynolds' resignation has been in the hands of members of the board for about ten days, but action was deferred until after the election of new board directors. The board is now composed of J. Harvey Wilson, D. Hewitt Wood, S. S. Price, Walter Temple, J. Kent Boyd, T. N. VanDyke, M. M. Hedges, Paul J. Kruesi and J. T. Giles.

The manufacture of paper will be abandoned for the present and only the pulp mill kept in operation.

Announcement was also made S. E. Seaman will continue as sales manager.

Ask Rehearings in Trade Association Cases

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 15, 1925.—The Deparment of Justice has filed a petition with the Supreme Court of the United States asking for rehearing in the two trade association cases in which opinions were recently handed down by the court including the Maple Flooring Association and the Cement Manufacturers Association. Whether or not the court will grant this rehearing will not be known until the October term of court.

It is only in the rarest instances that the court allows rehearings in connection with any of its decisions. These cases, however, are somewhat different inasmuch as the court did not follow precedent in its opinion.

Coal and Ashes Handling Methods

The Link-Belt Company has just announced the publication of a new sixty-eight page book describing new methods for handling coal and ashes in boiler houses.

The book is beautifully illustrated; showing installations of the Peck Carrier in the boiler houses of many public buildings, such as the new Tribune Tower in Chicago, and in many industrial plants throughout the United States.

It also contains much data of interest to engineers and architects; and is of particular value to anyone interested in boiler houses and their equipment. The Peck Carrier is also used for handling Cement, Sand, Ore and other materials.

A copy will be mailed upon request to the Link-Belt Company, Chicago, Indianapolis or Philadelphia.

Strathmore Paper Co. Employees Get Vacation

[FROM OUR REGULAR CORRESPONDENT]

WORONOCO, Mass., July 20, 1925.—The employees of the Strathmore Paper Company here are much elated at the receipt of a letter from President H. A. Moses announcing the action taken by the board of directors in the interest of their employees. They have decided to give all their workers who have been in their service over three years a vacation with pay. Nearly 100 of the employees have worked for Strathmore over ten years or more and will receive two weeks' vacation and pay. Those in service from 3 to 10 years will receive one week's vacation with pay.

Appeal in German Wrapping Paper Case

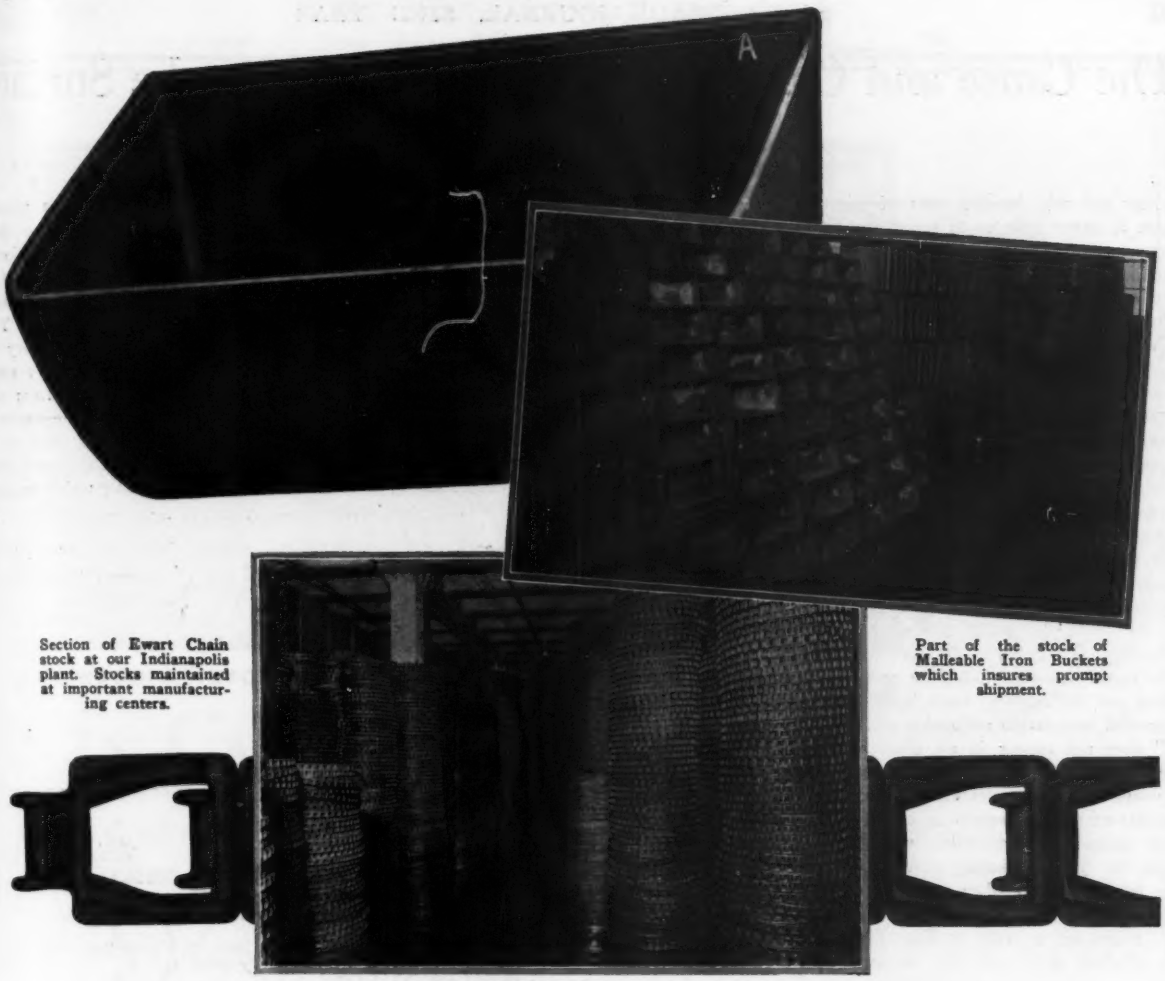
[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 22, 1925.—Word has been received here that the Assistant Attorney General of New York has taken an appeal in connection with a decision of the Board of U. S. General Appraisers involving the dutiable value of wrapping paper imported from Germany. The action has been approved by the Assistant Secretary of the Treasury Andrews.

Joins Moore & Thompson Paper Co.

[FROM OUR REGULAR CORRESPONDENT.]

BELLOWS FALLS, Vt.—William Bronk, formerly superintendent of the plant of the Deerfield Valley Paper Company at Monroe Bridge, Mass., has been made superintendent of the plant of the Moore & Thompson Paper Company here.



Section of Ewart Chain stock at our Indianapolis plant. Stocks maintained at important manufacturing centers.

Part of the stock of Malleable Iron Buckets which insures prompt shipment.

Another Advantage—Immediate Delivery from Link-Belt Stock

CONTINUOUS PRODUCTION—made possible by the large number of users—enables Link-Belt to maintain the largest complete stock of chains, wheels and buckets in existence.

This means much when you're in a hurry—when you want not only immediate delivery, but the assurance that your order will be carefully and understandingly filled.

In every case you are assured that the Link-Belt chains, wheels and buckets supplied you are built to the same high standards that characterize all Link-Belt equipment.

Your chain, wheel and bucket money will purchase longer service when you use Link-Belt trade ⟩—⟨ marked products.

2271A

LINK-BELT COMPANY

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CHICAGO, 300 W. Pershing Road
INDIANAPOLIS, 200 S. Belmont Ave.

New York . . 2676 Woolworth Bldg.
Boston . . . . 49 Federal St.
Pittsburgh . . . 335 Fifth Ave.
Buffalo . . . 745 Ellicott Square
Wilkes-Barre, 526 Second National Bank Bldg.
Huntington, W. Va., Robson-Prichard Bldg.

Cleveland . . 329 Rockefeller Bldg.
Detroit . . . . 5936 Linsdale Ave.
St. Louis . . . . 3638 Olive St.
Kansas City, Mo., R. 405, 1002 Baltimore Ave.
Denver . . . . 520 Boston Bldg.

Minneapolis, Minn. . . . . Link-Belt Supply Co., 418 S. Third St.
Louisville, Ky. . . 321 Starks Bldg.
Ashland, Ky. . . . . V. P. Dalmas & Co., 100 W. Winchester Ave.

New Orleans . . 504 Carondelet Bldg.
Whitney Supply Co., Ltd., 733 Tchoupitoulas St.
Birmingham, Ala., 720 Brown-Marx Bldg.
Atlanta, 610 Citizens & Southern Bank Bldg.
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H. W. CALDWELL & SON CO.:—Chicago, 1700 S. Western Ave. New York, 2676 Woolworth Bldg. Dallas, Texas, 810 Main St.
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LINK-BELT

THIS YEAR LINK-BELT IS FIFTY YEARS OLD

The Cause and Cure for Welts or Wrinkles in the Surface of Rolls of Paper

Any one who handles rolls of paper, either as a producer of them in paper mills or in paper converting plants, also those who rewind rolls of paper in plants manufacturing paper products, are familiar with the fact that ridges, or welts, or wrinkles, as they are variously called, often appear in the surface of a finished roll *after* the roll has been wound and removed from the winder.

When the roll is just finished there is seldom any trace of these welts, but they begin to appear immediately afterwards; in some cases it takes hours, in other cases days for them to make their appearance. See Fig. 1. These welts extend to various depths downward from the outside of the roll, in some cases only 1/8-inch or so, and in extreme cases 1/2-inch or even 3/4-inch. It is also a familiar fact that when the outside layers of a roll which is so affected have been removed to a depth where the roll is perfectly free of these welts, the process will begin all over again; and within a brief time, possibly only a few hours, the roll is again corrugated on its outside surface quite as badly as in the beginning. If the outside plies are again removed to the depth of the welts, the whole process repeats itself and will keep on repeating clear down to the core of the roll.

It is safe to say that these welts in some mills or converting plants are the cause of more broke and annoyance than any other source of loss in the utilization of rolls. Of course, this "welting up" does not appear in all kinds of paper nor in every roll of the kinds of paper that are liable to this tendency. In the main, it would seem that any kind of paper, excluding of course, such weights as might properly be classified as paperboard, can develop these welts when improperly wound into rolls; and on the other hand, the proper winding of rolls can in great measure prevent this tendency, even when producing rolls of paper which is most prone to welt up into corrugations.

It might be in order to first discuss the cause for the formation of these welts, and then the most effective preventive means.

Cause of Welting Up Traced to Source

Whether the roll is wound at the end of a paper-making machine direct from the reels, or behind a super-calender, coating machine or the like; or whether it is formed by a rewinding operation where the web is fed from a jumbo roll which has previously been wound—the treatment of the web in the process of winding is basically the same. That is to say, there is always a tension or drag down the length of the web so that it can be kept under control in going forward to the roll which is being wound. In making the paper on the paper machine, it is worth considering what actually happens to this web through the successive handlings it has to undergo either in the making or the converting of the paper. It is always a case of a drag strain lengthwise on the web.

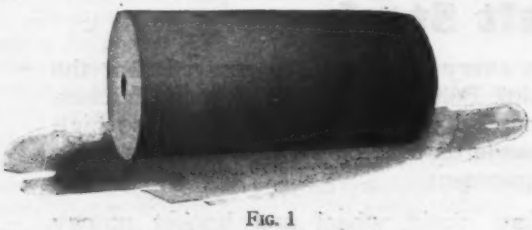


FIG. 1
Roll of bond paper, showing wrinkles.

After all is said, paper is a somewhat elastic substance, some kinds more elastic than others. For instance, bond papers, dry or water-finished manila paper, also kraft paper, have a greater degree of elasticity and will also stand a greater tension than newspaper, for instance. It is also true that in the first mentioned papers the tendency to "welting up" on the outside of the finished roll is apt to be greater than in the case of newspaper, although the latter is by no means free of this tendency at all times. The actual fact is that the drag on the web which is necessary to keep the web flat and under control, much certainly have some effect on the web. The paper travels under tension from the last dryer of the paper machine to the calenders, and it encounters another tension between the calenders and the reels, and again between the reels and the winder. If the paper is rewound later on in converting it, it encounters still another drag under tension.

Theory of Cause Corresponds with Facts

In theory it is reasonable to suppose that these draw stains have some effect on the web, and that this effect would be to

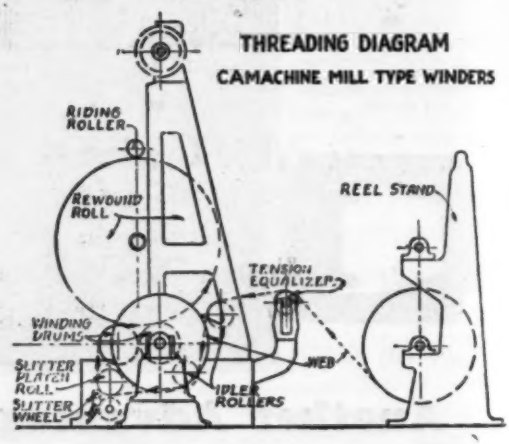
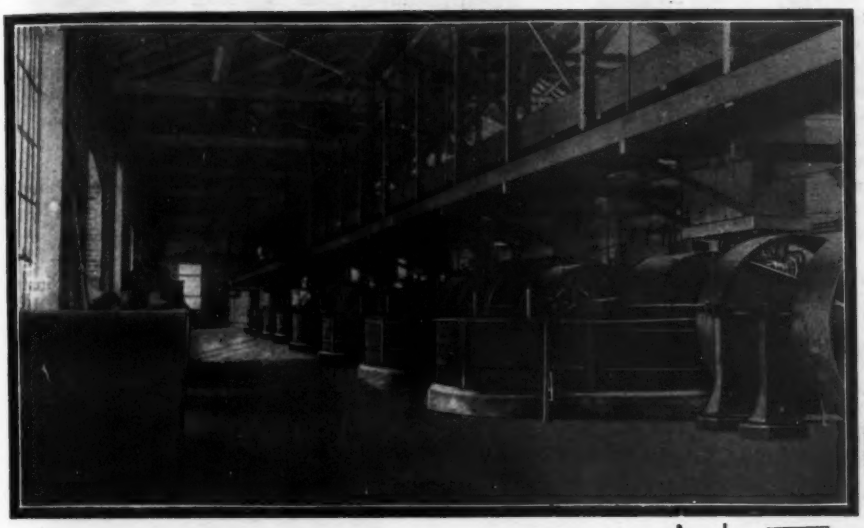


FIG. 2
Typical end elevation of Camachine Mill Type Winders.

slightly narrow it from its normal width; that is to say, from the width which the web would naturally assume if it were laid out flat under no draw strains whatever. The web lands on the roll while under the influence of this drag. The theory ties with the actual facts as proved up by cutting a band of paper, say 2 inches or 3 inches wide, across the face of a corrugated roll. Upon gently smoothing it out, it will be observed that a strip so cut from a roll of bond paper, say, for instance 100 inches face-width, will actually measure 100 1/8 inch, 100 1/4 inch, or in some cases 100 3/8 inches. The doubting Thomas will say that this is due to the fact that the welting process has actually stretched the width of the paper; but the answer is that going back of this test and proving up another way, it will be found that the width was actually there prior to the formation of the wrinkles. In other words, the actual or normal width of the web is wider than the face-width of the roll after the paper is wound. This can be proved up by making a pencil mark near the edge of one side of the web as it passes from the calenders to the reels, with a corresponding mark 100 inches from same on the other side of the web. That is to say, an air line from the mark on the one side to the mark on the other side would be exactly 100 inches. When later on this marked portion comes over onto the roll on the winder, it will be found that these marks



Pioneer
Paper Company
Los Angeles

IN CALIFORNIA

in their modern paper mills you will see row after row of Dilts Beating Engines. Western progress has demanded the best equipment and their selection is Dilts Beating Engines. "Their paper is made in their beaters."

For sixty years our shops have been producing Hollander type Beating Engines and they are in use literally "around the world." Now we also build the Dilts approved NEW TYPE Beating Engines which are superior to others in combining High Speed, Rapid Mixing, Uniform Beating, Quick Dumping, and **no increase in power consumption.** The Dilts approved NEW TYPE is truly a remarkable Beating Engine.

Send for list of users, names of recent purchasers, and list of our unshipped contracts. You will be interested.

Dilts

MACHINE WORKS, Inc. FULTON, N.Y.

EXPORT OFFICE ~15 PARK ROW~ NEW YORK CITY

are less than 100 inches apart; but when a strip is cut off and laid flat as above, the marks are more than 100 inches apart.

Another factor to be emphasized here is that there is actually more than 100 inches width in the web in between the marks which are spaced 100 inches apart in an air line, as there is always a certain amount of wave, or cross slack, or "draw wrinkles." This cross slack is seen between the dryers and the calenders, between the calenders and the reels, and between the reels and the winder. It would seem, therefore, that the marks on the roll of paper ought to be farther apart than the 100 inches mentioned when the paper lands on the roll, on account of this very fact that the paper between the marks is at least 100 inches wide in an air line, plus a certain amount allowing for these draw wrinkles, whereas the marks are less than 100 inches apart when measured on the roll.

The above means, in plain terms, that a width of web in excess of 100 inches has actually been wound into a roll which is less than 100 inches wide.

Welts Develop After Roll Is Wound

To all appearances, the outside surface of this roll is smooth and regular and perfectly cyclindrical, and so it is for the time being. It must be borne in mind, however, that there has been wound into this roll a web which is actually wider than 100 inches between the marks, that this winding has been done under continual draw strain, and that the paper, if it had its own way, would like to resume its normal width. This would be its width if it were perfectly flat and free of the stretch or draw wrinkles that are present in each of the plies of paper which have been wound into the roll from the center to the last outside ply.

When the roll is finished and set aside, the "welting up" process begins within a comparatively short time, if it is to occur at all. Close observation will disclose that the welting occurs first in the form of a slight puckering or ridging in one or two of the very outside plies of paper. Within a very short time it is observed that instead of one or two of the outside plies, three

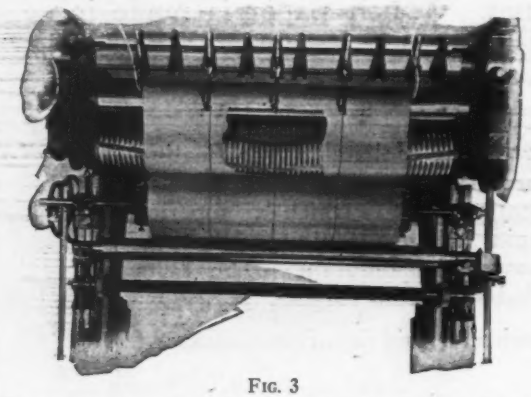


FIG. 3

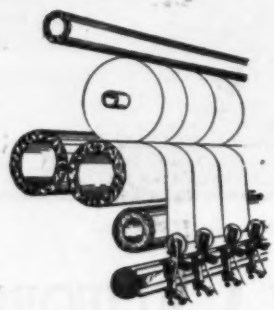
Phantom view of grooving in front drum, Camachine Mill Type Winders.

or four or more have followed the example of the outside ply; and that instead of a local puckering or blistering as at the very start, actual ridges or welts begin to build up and to elongate themselves into welts a few inches long, then longer, until part of the way around the roll, gradually becoming irregular circles, in some cases clear around the roll. These ridges become progressively deeper and firmer, even to a depth of ¼ inch or more, as the under plies begin to follow the lead of the outer plies, and soon become welts which permanently wrinkle or emboss the surface of the paper and cause more actual broke loss than any other single source of broke.

Welts Develop from the Outside Inward

This is nothing more or less than the reaction of the paper against the draw strains that have been built into it. The natural surface width of the paper is actually wider than the surface of the roll. The tendency to resume its normal width begins to operate, naturally, from the outside first, with the result that in seeking to widen out to its normal width, there is a slight creeping of the outside plies from the center out towards each end; and where this creeping is halted through friction contact after proceeding only a short way, the web buckles upward slightly at such points. Then the next ply below reaches this same point and buckles upward, and so on until the welt or ridge is built up into a corrugation which would resist the blow of a hammer to flatten out.

There are many theories put forward by those who have to contend with this "welting up" tendency, and many of these theories, although apparently contradictory on first examination, really tie together and support each other. For instance, some



CAMACHINE *Score Cut Method as applied to* CAMACHINES 12, 14 *and* 18

FIG. 4

Diagram of patented Camachine principle of slitting and winding.

say that these welts come from exposure of the outside of the roll to moist air; others say dry air does it. In the one case they are called "expansion wrinkles;" in the other, "contraction wrinkles." They are primarily due to the contraction of the width of the web prior to its being wound into a roll, and the later tendency of the web to expand to its normal width after it is on the roll. Certainly both theories are, in a sense, right, but certainly exposure to the air is not their prime cause. The contraction of the width of the web temporarily, and its later effort to expand, is the real cause.

Preventive Measures for Welting

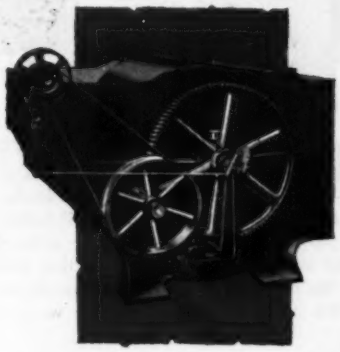
So much for the cause—let us now consider preventive means for these troublesome pests to both makers and users of roll paper.

It would seem, in view of these facts, that the complete and final cure would be to actually flatten out or in some way stretch out the web to its normal and natural width prior to its passing onto the roll; in other words, set up a lateral pull on the web to offset the lengthwise pull referred to above. This, however, is by no means a simple proposition.

A so-called bow spreader will certainly not do this, as a bow spreader tends to narrow the distance between the edges of the web by bringing the web over a curved or bowed surface. In no sense does a bow spreader actually spread the web in width. There is, therefore, no hope in the bow spreader as a means of eliminating or in any way lessening the tendency to the welts we are considering. In fact, the bow spreader tends to aggravate them by narrowing the distance from edge to edge and by stretching unduly the central portion of the web.

A method of spreading by means of spirally grooved guide rolls, or by means of nip rolls placed at an angle with the path of the paper, tending to draw the sheet out laterally as it passes towards the winder, is, in a measure, practicable. The spiral

BIRD SAVE-ALL



IS there one point in your mill where white water is allowed to run into the sewer?

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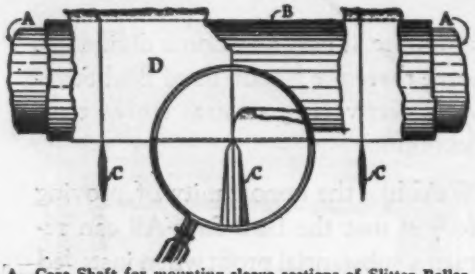
grooves are practicable in some cases, although objectionable on account of their unfavorable action on the finish of certain kinds of paper. The nip rolls are practicable on extra heavy weight sheets, but not on light weight sheets; and the wrinkling is apt to be greater on the light weight than on the heavy weight sheets, as the light weight is more affected by the drag and the tendency to crosswise slack.

No universally successful means exists for the actual spreading of the paper laterally which is dependable in each and every case, but one thing is universally helpful, and that is to reduce the drag or tension on the web to a minimum in the roll-winding process; that is to say, to so design the winder that it will produce firm rolls with the least possible draw strain on the web. Furthermore, provision should be made in the winder for flattening the surface of the web so that it is free at least of the "draw wrinkles" or slack across its width, prior to its passing to the roll that is being wound.

Referring to the first proposition as to winding a firm roll with the least possible tension on the web, it is obvious that the web should not be slit into sections at a point far distant from the point where the winding is done. For best results in mill type winders the slitting apparatus much be placed immediately under the front winding drums (see Figs. 2, 3 and 4), so that the slit sections of paper do not have to travel far from the point where they are slit to the point where they are wound. There is obviously more chance for the slit sections to be affected by the draw strain through a long draw than through a short draw. Furthermore, slitting at a distance from the point where the winding is done is disadvantageous for the reason that any one of the slit sections, when, for instance, the original web is being divided into two, three or more slit sections, can and often does stretch slightly prior to reaching the point of winding. This in turn calls for an increased draw strain on the whole web by tightening the tension on the reel brake.

Faulty Winding Methods Chief Cause of Welts

The result, therefore, is that from the very fact of slitting too far from the point of winding, some of the slit sections often have to bear a greater burden of draw strain than would be necessary if the whole web were brought close to the winding before slitting into separate sections. This in turn aggravates the tendency to welts on account of this excess tension.



A—Core Shaft for mounting sleeve sections of Slitter Roller. B—Flint hard polished steel surface of Camachine Slitter Roller. C—Camachine Slitter wheel mounted on Ball Bearings. D—Material being slit by Camachine Score Cut method.

FIG. 5

Diagram of Camachine Score-Cut method of slitting.

It is interesting to note that excessive tension makes excessively hard rolls, and these hard rolls are the most prone to develop the welts or wrinkles, not because they are hard, but because excessive tension reacts in the form of welts, the excessive hardness having nothing to do with this result.

It is for this reason that an efficient winder must handle the web with the least possible tension on all the slit sections. The web should be threaded *over* the face of the front drum as in Figs. 2, 3 and 4, rather than *between* the drums. When the latter is the case, the roll of paper, as it builds up, tends to become progressively harder through the increase of its own weight, helped by the down pull which seats the roll of paper still more firmly on the drums and adds to the burden of increased weight, plus the factor that when the web is threaded *between* the drums, one of the drums (usually the front drum) is necessarily run at a higher surface speed than the rear drum. What happens, therefore, is that the threading of the web *between* the drums rather than *over* the face of the drums, tends to produce an excessively hard roll, which is as much as to say—a roll having too much draw strain on the web. That is the kind of roll which is the most prone to welting up after being wound. The evils of threading between the drums are independent of the relative position of the slitters, which in the old style of winder are usually at a distance in the rear of the machine, making matters worse, as already pointed out.

FIG. 6

Showing the smoothing action of patented Camachine system of grooving.

The Camachine Winder Principles Described

The nearest approach to a complete answer to the troublesome and broke-producing welts, is found in the type of winder where provision has been made for handling the web with the gentlest possible strain on same, prior to the slitting and winding. This is realized in machines where the slitting is done close to the point of winding, and where the web is threaded over the front drum with a counterweighted riding roller resting on the upper surface of the rewound rolls as they build up in diameter. See Figs. 2, 3 and 4.

In mill type machines built by Cameron Machine Company, with which the writer is connected, the "two-drum, riding-roller" system of winding has been proved by many years of experience and development of same; and this system of winding has been supplemented by a patented system of grooving in the front one of the two drums. See Figs. 3, 6 and 7.

These grooves consist of very shallow and wide depressions in the surface of the drum, running spirally close together from the center outwards to each end. They insure the complete separation of the rewound rolls, and they have the further effect of insuring the perfect and even distribution of the crosswise slack or "draw wrinkles" described above, which may not have been removed by contact with the surface of the guide rollers which steer the web to the point of slitting and winding. One of these guide rollers is provided with self adjusting angling means so as to insure the flat, smooth draw of the web with a minimum of tension on any portion of it.

Coupled with these spiral grooves in the surface of the front drum, is a very wide and very shallow groove running slantwise from the center each way, at a slight angle to the axis of the

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drum as shown in Figures 3 and 6. These grooves are provided for taking care of slack edges which frequently occur in the web, passing this slack along to the roll without permitting it to accumulate in front of the roll and form into actual wrinkles at the edges, and at the same time permitting the web to draw flat and even under the minimum amount of tension.

The slitting method which is combined with this roll-winding method is the so-called camachine "Score-Cut" method. Its location is directly below the front drum. See Figs. 2, 3, 4 and 7. This method permits of the slitting of the web under a very gentle draw strain, whereas the old style method of overlapping rotary shears, wherever they are placed—near the front drum or, as usual, at a distance well in the rear of the two drums, calls for a rather stiff tension on the web at all points. Especially is this the case on the edges of the web. The rotary shear method of slitting is objectionable, in addition to other reasons, because at all times it demands a greater drag or strain on the web than is necessary with the camachine Score-Cut method of slitting, where the web

FIG. 7

Typical installation, Camachine Mill Type Winder.

is firmly supported on the surface of a smooth platen roll and is independent of any excessive strain. The slitting is done while the paper is in contact with and supported by the smooth face of this platen roll.

It sums up, therefore, that the welts or corrugations we have been considering arise from the tendency of the web to contract in width under the draw strains it has to encounter on its path to the finished roll. It follows that any method by which these draw strains can be lessened is a step in the right direction. A winder which goes to the limit in the matter of handling the web gently has the ability, for that very reason, to produce rolls in which the wrinkling tendency has been reduced to a minimum and in most cases entirely eliminated.

Slitting and roll-winding machines which are designed and built on correct basic principles not only handle webs of paper in a way calculated to deliver rolls which are free of welts and other defects, but the production cost of these rolls is less for the season that correctly designed machines are simple, swifter and more dependable to operate.

Watson Frye Co. Sold

BATH, Me., July 17, 1925.—The Watson Frye Company is reported as having been sold to interests headed by New York capitalists. It is intended to enlarge the present plant and manufacture lines of pulp and paper machinery on a large scale. Harry E. Tidmarsh, formerly associated with the Union Iron Works of Bangor, it is understood will be the new general manager of the company. Mr. Tidmarsh has long been identified with the building of pulp and paper mill machinery.

Report in Prevention of Blindness

There is no such thing as a non-hazardous industry—this is the conclusion of the National Committee for the Prevention of Blindness as indicated in the report of an extensive study of eye hazards in industrial occupations recently completed by the committee, a summary of which was issued here today by Lewis H. Carris, managing director of the committee.

The report declares that "of the 100,000 blind persons in the United States approximately 15,000 are the industrial blind—persons who have lost their sight in the pursuit of industrial occupations—and there is in addition to the totally blind a much larger number of men, women and children whose vision has been so impaired by the eye hazards of industry that they are handicapped throughout life. Both of these classes, the industrial blind and the workers whose vision has been seriously impaired by the hazards of other industrial environment, grow larger each year."

There is hardly an industrial occupation in America, according to the National Committee, which does not add each year to the steadily increasing number of the blind and the near blind. Referring to the experience of just one insurance company which in three and a half years settled claims involving 1,049 cases of permanent disability resulting from eye injuries, the report says: "The loss of 82 eyes in the presumably safe occupations of merchandising, farming, and textile manufacture is further proof of the statement that serious eye accidents are likely to occur wherever men, women and children are employed. There is no such thing as a really non-hazardous occupation."

The committee found that although from a national point of view the metal manufacturing industries are the source of the greatest number of serious eye injuries, in Pennsylvania the coal mining industry ranks first as a cause of industrial blindness. In Wisconsin it was found that hand tools constitute by far the greatest single cause of eye injuries, being responsible for 44 per cent. As an example of the important part that eye injuries play in the whole problem of industrial accidents the report cites the experience of a large shipbuilding company in whose dispensary 38 per cent of all injuries treated were eye injuries. More than 4,300 eye cases were treated in the dispensary of this one company in one year.

The section of the report dealing with the nature and cause of eye injuries closes with the statement: "Until industry knows exactly where, when, how, and why eye accidents occur it will not be in a position to do justice to the existing opportunities for the elimination of such accidents, much less to develop new means of prevention. The keeping of detailed and accurate records of the nature, causes, and costs of eye injuries on the standard basis developed by the International Association of Industrial Accident Boards and Commissions is, therefore, recommended as the first step in any campaign for the prevention of eye accidents in the individual industrial plant or in an entire industry."

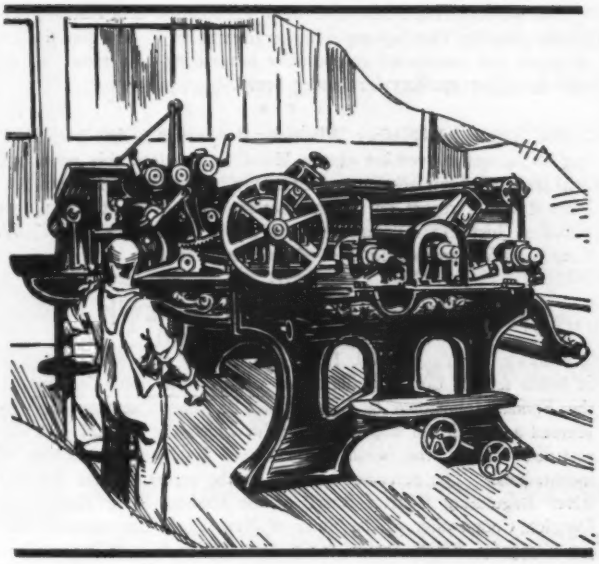
Copies of the full report, a volume of 250 pages, may be secured from the headquarters of the Committee for the Prevention of Blindness, 130 East 22nd street, New York City.

Kalamazoo Products in China

[FROM OUR REGULAR CORRESPONDENT]

KALAMAZOO, Mich., July 20, 1925.—Paper and board, manufactured in Kalamazoo and other points in Michigan, are finding excellent markets in China and being imported in increased quantities to that country, according to an interview given the Associated Press by the Detroit office of the Department of Commerce. The increase last year at the port of Shanghai, which receives approximately two-thirds of China's paper imports amounted to approximately 20 per cent over 1923 and those at Tienstin, the port of the Peking district, 36 per cent. An increase of approximately one-third also occured in importations into the district of Hankow.

2 TONS PER DAY SAVED from the Waste Heap!



IN one instance we found 420 pounds of board wasted when the sheet had broken down while the slitters were re-set. With ten changes a day, as sometimes happens, the waste piles up and up.

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New York Trade Jottings

The American Paper and Pulp Association is co-operating with the census bureau in revising its paper schedules for the annual census of manufacturers.

* * *

The Salesmen's Association has not had one of their weekly luncheons so far this month but a round-table session will be held next Monday at the Hotel Belmont.

* * *

Harod Francke of Stockholm, Sweden, whose father is largely identified with the pulp industry in Sweden, has been in this country for several weeks, studying the pulp and paper situation.

* * *

The American Paper and Pulp Association may submit a brief covering the interests of some of its members at an Interstate Commerce hearing to be held on July 30 on the shipment of liquid chlorine in multiple unit tank cars.

* * *

The Binders Board Manufacturers' Association at a meeting held in this city on Tuesday gave further discussion to its simplification program and considered co-operative advertising as a means of securing larger markets for binder board.

* * *

The National Wallpaper Wholesalers' Association has been holding its annual convention at the Hotel Commodore this week and will conclude their sessions on Saturday. Among the matters considered was a report on the international exposition at Paris, prepared by Justin O. Allman, president of the Association, and C. W. Cousins, who represented the body as commissioner.

Seek to Restrain Bonds for Conklingville Dam

[FROM OUR REGULAR CORRESPONDENT]

ALBANY, N. Y., July 20, 1925.—On the eve of a $2,000,000 sale of bonds for the Conklingville dam project by the State Comptroller the Fonda, Johnstown & Cloversville Railroad Company has instituted a suit in the Supreme Court in which the plaintiff seeks to restrain, forever, the issuance or sale of bonds or certificates of indebtedness. The defendants named in the action are the Hudson River Regulating District Board of the Hudson River Regulating District, Comptroller of the State of New York, International Paper Company, Finch, Pruyn & Co. Inc., Union Bag & Paper Corporation, the Indian River Company and Adirondack Power & Light Corporation.

The action is of vital interest to the Paper industry up-State which has for years sought a means of controlling the flow of the Hudson River so as to eliminate floods and low water at certain periods of the year. The suit, which will be tried in Fulton county, precipitates what observers believe will be one of the most important legal battles in State history.

A long recital of injuries, losses and unlawful proceedings is alleged against the defendants. The contention of public benefit as set forth by the defendants is charged by the plaintiff to have "no foundation in truth and affords scant drapery to cover a selfish, destructive, money making scheme of greed to fill corporate coffers in disregard of inalienable rights of the plaintiff corporation" . . . . The entire constitutionality under which defendants have proceeded is challenged by the railroad corporation which states that the contest, if necessary, will be carried to the Supreme Court of the United States.

The erection of the much discussed Conklingville dam, in the language of the complaint, is to develop water power for their (defendants) sole and and exclusive benefit. The railroad charged that the defendants in 1922 "entered into unlawful agreement, through petition, to encompass, via the medium of the Water Control Commission, the Hudson River Regulating District, the authority under which they are proceeding." The point is raised that the article of the Conservation law under which the defendants are proceeding was not intended to permit building of dams to create water powers to facilitate generation of electric energy for public or private use. . . It is also charged by the railroad corporation that no plans for the construction of a dam or reservoir in the district other than the defendants, made before the creation of the Board of Hudson River Regulating District, have been considered. Their employment of a large staff of engineers, assistants and counsel to construct the dam is characterized as unlawful and as a conspiracy.

The Conklingville dam, 750 feet above sea level, will, it is alleged, put the plaintiff railroad out of business unless a fabulous re-investment is made. According to the complaint "the tabulation of benefits show that the corporations and individuals will receive over 95 per cent as against less than five per cent for five cities and one village, based on construction cost" and it is further charged that "this refutes any theory possible in advance that construction of the dam and reservoir are warranted to lessen flood damage." The water of Sacandaga River, it is contended, contribute less than one seventh of the waters of the Hudson river above Albany.

"Unlawful, unconstitutional performance is alleged if interference is made with the railroad, because of power vested by Congress in the Interstate Commerce Commission; also because the construction of the dam is not for the purpose contended; also that the value to the private interests will be $20,000,000, twice the cost upon which federal and state taxes will be assessed; that said cost and expense of creation and maintenanee of dam and reservoir must be paid by private beneficiaries listed and set forth in assessment thereof." Finally the constitutionality of the law under which proceedings have been started for the erection of the dam and reservoir is disputed. The allegation is made that the state boards are not jointly or severally in position to a judgment for large and substantial damages if plaintiff succeeds in this litigation.

News of the Boston Trade

BOSTON, July 20, 1925.—A renewed demand for hot-weather specials, almost as active as the call of three weeks ago, was the one bright spot in an extremely dull week here. Dealers in summer specialties agree that this season has been one of the best in years, the demand for cups, napkins, paper plates and other picnic and resort accessories almost establishing a record. With it all prices have remained the same—a slight fluctuation here and there, being an exception.

The call for other lines has been steady, but the orders are small and to regular customers. Samples of the fall stationery, mostly social, are being circulated in the trade and all indications point to some very novel lines. Orders already have been placed for some designs and a lively business, beginning probably late in September, is anticipated. Printers continue to share good business and their demand for fine grades stimulates what would ordinarily be a dull period.

The paper box men see some improvement. Their customers' stocks are low and the time is near when orders must come in, it is pointed out. Holding off for a break in prices, is futile, one dealer explained. The time to buy is now, he added. This branch of the trade, like others, is optimistic over future business and leaders look back to the six months past and agree that the period compared favorably with the first six months of last year.

Coated and book papers are in demand in various quarters. In the coarse division there is little business, kraft orders falling off noticeably. The roofing stock has a steady call and dealers in this branch say they see no let up in sight for the summer.

The rag stock business is still off, mills running very close to the margin and little buying and collecting being noted. Dealers, as a whole, have settled down for a two-month quiet period, satisfied that by September things generally will be improved.

The Voith High Pressure Stock Inlet

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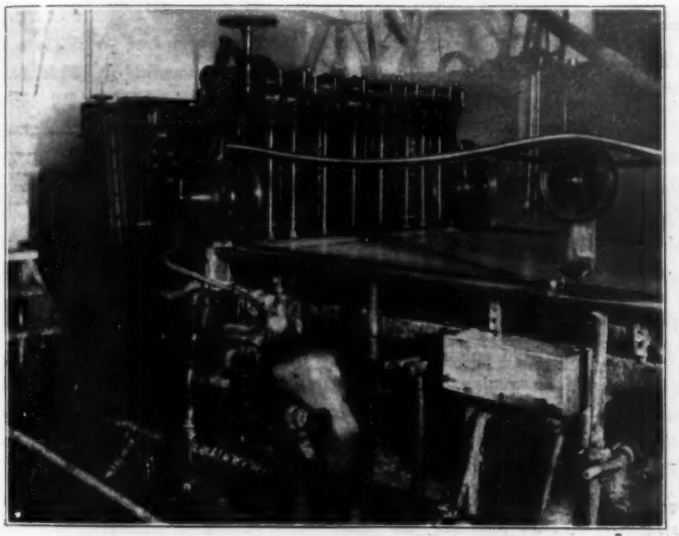

The Voith High Pressure Stock Inlet represents an improved method for feeding the stock onto fourdrinier (straight type), Harper and Yankee machines. It can be readily fitted without difficulty to existing machines and the time required for installation does not interfere whatsoever with the regular weekly production.

Voith Inlets are operating successfully on high, medium and low speed machines varying in width from 38" to 206" and are producing a large variety of papers ranging in weight from 9 lb. to 150 lb. Every installation shows a beneficial effect on quality, output and production costs.

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Your copy of the Voith Stock Inlet booklet is waiting for you. Write for it today. It describes in detail the High Pressure Stock Inlet, a new piece of equipment that makes possible a sheet of uniform caliper and of much better formation than you ever before produced. This improved product can be made at a lower cost. This booklet contains proofs of these statements. Do not fail to get your copy. A letter will bring it to you.

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PAPER
The Magazine of the Paper Industry

HENRY J. BERGER, Editor

Member A. B. C. Audit Bureau of Circulations

Vol. LXXXI New York, July 23, 1925 No. 4

CANADA'S PULP AND PAPER INDUSTRY

A preliminary report on the Pulp and Paper Industry for 1924 has just been issued by the Forest Products Branch of the Dominion Bureau of Statistics. This industry in Canada includes three forms of industrial activity, the operations in the woods with pulpwood as a product, the manufacture of pulp and the manufacture of paper.

The total value of pulpwood produced shows an increase of 1.2 per cent. The total value of pulp produced decreased by 8.8 per cent in value, while the value of paper produced increased by 4.1 per cent. If the net value of production for the entire industry be considered as the sum of the values of pulpwood exported, pulp exported and paper manufactured, then the total for 1924 was $187,174,703, as compared to $188,642,109 for 1923, $158,483,377 for 1922 $154,641,077 for 1921 and $224,414,131 for 1920. The maximum, which was reached in 1920, was followed by a decided decrease in 1921, but the figures for 1922 and 1923 show increases. The small decrease in 1924 is due to a falling off in value in the exportation of raw pulpwood and decreases in the manufacture and exportation of pulp. The manufacture and exportation of paper both show satisfactory increases.

There were 115 mills in operation in Canada in 1924 as compared to 110 in 1923. Of these mills, 46 manufactured pulp only, 34 were combined pulp and paper mills and 35 manufactured paper only. The 80 mills manufacturing pulp produced 2,465,011 tons of this commodity valued at $90,323,972, as compared to 2,475,904 tons valued at $99,073,203 in 1923, representing a decrease of 0.4 per cent in quantity and 8.8 per cent in total value. Of this total 1,497,564 tons valued at $44,460,141 were made by combined pulp and paper mills for their own use in the manufacture of paper, 266,975 tons valued at $14,460,176 were manufactured for sale to paper mills in Canada and 700,472 tons valued at $31,403,655 were manufactured for export.

The 69 mills manufacturing paper in 1924 produced 1,718,741 tons of paper, which with certain miscellaneous pulp products were valued at $133,395,673, as compared to 1,589,303 tons valued at $128,089,609 in 1923, an increase of 8.1 per cent in quantity and 4.1 per cent in total value.

News print made up 80.8 per cent of the paper manufactured in 1924 amounting to 1,388,081 tons valued at $100,276,903 as compared to 1,251,541 tons valued at $93,213,340 in 1923, an increase of 10.9 per cent in quantity and 7.6 per cent in total value. Under this heading are included news print in rolls, news print in sheets for printing, hangings and poster paper. The production of news print in the United States during approximately the same period was reported as 1,471,000 tons. Allowing for differences in classification and differences in the periods covered by individual reports this indicates that Canada's production of news print has approached to within a hundred thousand tons of that of the United States.

The total capital invested in the industry in 1924 was $459,457,696 as compared to $417,611,678 in 1923, an increase of $41,846,018, or over 10 per cent.

The total number of employees on salaries and wages was 27,627 and the total payroll was $37,649,488, as compared to 29,234 employees in 1923, with wages and salaries amounting to $38,382,845.

The apparent total production of pulpwood was 4,647,201 cords valued at $57,777,640, as compared to 4,654,663 cords valued at $57,119,596 in 1923. Of this total in 1924 about 71.4 per cent or 3,316,951 cords valued at $44,241,582 were manufactured into pulp in Canada while the remaining 28.6 per cent or 1,330,250 cords valued at $13,536,058 were exported to the United States. These figures show a decrease from 29.7 per cent to 28.6 per cent in the proportion of pulpwood exported. Domestic consumption has increased by 1.4 per cent while exportation has decreased by 3.9 per cent. No pulpwood is imported into Canada.

The total value of all materials used in pulp-making in 1924 was $50,798,958 and the total value of pulp produced including that used in combined pulp and paper mills for their own paper-making was $90,323,972.

The total value of all materials used in the manufacture of paper in 1924 including pulp made for own use in combined pulp and paper mills was $64,698,062 and the total value of paper and miscellaneous pulp products was $133,395,673.

The exports of wood pulp from Canada during the calendar year 1924 amounted to 781,983 tons valued at $40,242,972, as compared to 875,353 tons valued at $47,027,496 in 1923, a decrease of 10.7 per cent in quantity and 14.4 per cent in total value. During the same period the imports of wood pulp amounted to only 24,497 tons valued at $1,375,991, an increase over the imports for 1923.

The exports of paper and paper goods during the calendar year 1924 amounted to $99,248,497, as compared to $93,770,957 in 1923, an increase of 5.8 per cent. These exports were made up chiefly of news print paper of which 2,219,385 tons valued at $90,990,711 were exported, mostly to the United States. This represents an increase of 7.2 per cent in quantity and 6.3 per cent in value over the 1,137,962 tons valued at $85,611,258, which was exported in 1923. During 1924 the total imports of paper and paper goods amounted to only $9,327,942, an increase over the imports for 1923.

The gross contribution toward our favorable trade balance resulting from the activities of this industry in 1924 amounted to approximately $142,323,594 being made up of the value of pulpwood exported of $13,536,058 the difference in value between pulp

exports and imports of $38,866,981 and the difference in value between paper exports and imports of $89,920,555. The total for 1923 was $144,263,336.

The figures on which this preliminary report are based are subject to revision on further examination of the individual reports. The complete revised statistics for the industry for 1924 will be included in the regular annual printed report which will be available for distribution in a short time. Copies may be secured on application to the Dominion Statistician, Dominion Bureau of Statistics or to the King's Printer, Ottawa, Canada.

June News Print Statistics

Production of news print in the United States during June, 1925, according to the News Print Service Bureau amounted to 128,430 tons and shipments to 126,456 tons. Production in Canada amounted to 124,209 tons and shipments to 127,141 tons, making a total United States and Canadian production of 252,639 tons and shipments of 253,597 tons. There was also 6,616 tons of news print made in Newfoundland and 912 tons in Mexico in June, so that total North American production for the month amounted to 260,167 tons and for the first six months of the year to 1,547,643 tons. The news print mills also made 582 tons of hanging paper, 190 tons of which were made in Canada. Stocks of news print paper at United States mills totaled 31,864 tons at the end of June and at Canadian mills 23,965 tons, making a combined total of 55,829 tons which was equivalent to 5.2 days' average production. During June the United States mills operated at 88.5 per cent of capacity and the Canadian mills at 92.3 per cent.

Comparing production during the first six months of 1925 with the same period of each of the five previous years the United States mills made 1 per cent more than in 1924, and about the same as in 1923, 10 per cent more than in 1922; 23 per cent more than in 1921 and slightly more than in 1920; the Canadian mills produced 10 per cent more than in 1924, 20 per cent more than in 1923, 45 per cent more than in 1922, 100 per cent more than in 1921 and 70 per cent more than in 1920.

The combined production of the United States and Canadian mills for the first six months of 1925 was 5 per cent more than in 1924, 9 per cent over 1923, 25 per cent over 1922, 53 per cent over 1921, and 26 per cent over 1920. There was a production of 34,466 tons in Newfoundland and 6,269 tons in Mexico during the first half of 1925.

Smaller Size of Flexaco Belt Fasteners

A new smaller size has been added to the line of FLEXACO H. D. Belt Fasteners. The new size is intended for use on belts from ¼ to 7/16 inch thick on both conveyor and heavy duty power transmission service. It, like the four other members of the series, provides a tight butt joint with a great surplus of strength.

Interesting tests with this new size fastener by the manufacturers, the Flexible Steel Lacing Company of Chicago, have extended over many months and the final offering is known as the No. 1 size.

Each unit of this fastener consists of an upper and lower plate and two special bolts and nuts as illustrated. The pressure of the plates, drawn together with a wrench on the bolts and nuts, compresses the belt end giving a considerably stronger joint than one which might pull against the bolt holes only.

The manufacturers will supply samples of these fasteners, free of charge, upon request of interested parties.

John Bache-Wig, inventor of the process, for converting straw into paper-pulp has arrived in Edmonton for the purpose of conducting experiments to ascertain the commercial value of Alberta straw.

Use of Business Statistics

Development and proper use of business statistics by trade associations, along the lines laid down by the recent decisions of the United States Supreme Court, is strongly urged by the Department of Manufacture of the Chamber of Commerce of the United States in a bulletin just made public.

The bulletin starts out by saying that "for years trade associations have been faced with doubts about statistical activities in which they could lawfully engage. The members of many associations had come to fear that statistics of any kind were, in the opinion of prosecuting officials, inherently wrongful, when they related to economic activity.

"In this situation the Supreme Court itself has granted relief. On June 1 it handed down its opinion in two cases brought by the Department of Justice against trade associations, holding that the statistical activities of these associations were lawful. Thus, these opinions serve to indicate for all trade associations that there is no violation of the federal anti-trust laws if they gather and distribute the essential business facts which the Supreme Court described.

"With the clearer understanding of this liberty under the law (which remains unchanged), there is no bar to the development and proper use of business statistics. This clearing of atmosphere should mark the passing of guessing as to the facts concerning our commodity production and distribution provided there is a willingness, at source, to supply the informaton.

"It should be borne in mind," the bulletin goes on to say, "that the favorable rulings of the Court in the so-called 'Cement and Maple Flooring Cases' were based on the facts adduced in each case, just as their previous rulings in the Hardwood and Linseed Oil Cases were predicated on facts obtaining in these cases the law remaining unchanged.

"With these rulings as a basis, trade associations will undoubtedly appreciate the opportunity of rendering to their constituency invaluable service by providing means for the gathering and reporting of statistics dealing with such important trade information as producing capacity, orders, shipments, stocks and markets as shown by prices on closed transactions.

"In the renewing of statistical activities, it is timely to suggest simplification of methods and forms in order that the information which if found be obtained and presented as quickly and accurately as possible at the minimum of expense. Such uniformity will enable the transmission of information gathered in the form of charts or graphs when desired much less cumbersome than presenting great masses of figures. If uniformity of method is observed, it would greatly simplify the matter of not only charting a given line but also including such other lines as may be of collateral interest or important in comparing the trends of the industry. One of the important essentials of statistics is that they shall be fresh as well as dependable. A very encouraging number of trade associations are at present engaged actively in gathering and distributing such information and many others are familiar with the methods of doing so properly."

The Department of Manufacture announced that it will cooperate with trade associations interested, and will endeavor to bring about the contribution and interchange of information and experience which will prove of interest and value in this work.

Export Orders for B. C. Mills

After a protracted period of dullness, British Columbia's export trade in lumber has shown signs of life again and the prospects are for considerable activity during the remaining months of the year. The Egyptian government has placed orders for 8,000,000 feet of railroad ties in this market. Australia has ordered 10,000,000 feet of lumber to be delivered during July and August, and there is reason to expect that the British Government will give the sawmills of this province a large share in some lumber purchases to be made in the immediate future.

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Conducted by W.G. MacNAUGHTON, Secretary

Standard Methods of Testing Wood Pulp for Strength

By Gosta Hall*

I. INTRODUCTION

Although the question of standardization of a method for testing the strength of wood pulp, i.e., the strength as papermaking fiber, has been very much in the limelight in various countries for several years, no one method has as yet been generally adopted. This indicates that standardization in this case must be a rather complicated problem, and in fact it is.

However, this question is of such importance to all countries dealing with wood pulp and paper that it *must* be solved as soon as possible, and I think the time has now come for establishing successful international cooperation in this respect.

Any cooperation is helpful, and I feel sure a mutual agreement upon the lines along which future standardization work should be carried on would save much needless work now spent in attempting to improve methods based on incorrect principles.

The determination of the strength of wood pulp consists of several different operations—beating, sheet making, drying and testing—that all need standardization to secure a reliable method as a whole. However, there are so many methods suggested and in use in the pulp and paper industry at present, that a mere impartial study of all these methods, accompanied by a selecting and collecting of the best details, would probably create a method that might at least prove a good basis for continued work.

II. STANDARDIZATION EFFORTS IN FINLAND

Before proceeding to the main purport of this article, suggestions on standard methods, I wish to draw attention to a Finnish method, now gaining ground in Finland and Scandinavia. As the principle of this method differs from that of the American and Canadian methods, and as it seems to be a step towards successful standardization, a general description here might be of interest.

As early as 1913 Lampén[1] tried a method to determine the strength of sulphite pulp intended for the manufacture of imitation parchment. He constructed the apparatus necessary for this purpose, a ball mill and a sheet mold,[2] having the following points in mind: (a) the apparatus must be as independent as possible of the individual influence of the operator and (b) the strength of the fiber must be spared as far as possible during the beating.

Beating Method

From this point of view he considered it convenient to use a rolling movement for the beating, as beating with knives is always very individual and decreases the strength of the fibers more or less by cutting.

Further, in order to secure as uniform beating as possible, he constructed the ball mill with one big ball only, probably made of rustless steel, rolling in an ellipsoidal iron housing. In the usual ball mills, using several pebbles, the rubbing between the different pebbles as well as between the pebbles and the wall, cause local pressures of high intensity, and this factor must be eliminated to ensure uniform results. He made the ball rather big in comparison with the quantity of fiber to be beaten in order to ensure the necessary beating pressure as well as a constant rolling movement. The ball housing was dimensioned in such a way that the ball filled the lower section almost entirely, partly to increase the real beating surface, partly to prevent lumps of pulp from sticking to the interior surface.

This type of ball mill fulfils all requirements as to objectivity. Correctly built, with the same number of revolutions per minute, it will always do the same beating work, independent of external influences.

The dimensions and data of this first Lampén mill were as follows:

Ball housing:	
Diameter across the shaft	80 mm.
Diameter along the shaft	62 mm.
Free volume, about	110 cc.
Ball:	
Diameter	60 mm.
Weight	960 grams
Revolutions per minute	100
Furnish:	
Wood pulp	2.5 grams
Water	70 cc.

Sheet formed in the mold 100x300 mm.
Time required under these conditions for beating to imitation parchment stuff varied between 10 and 24 hours.

In 1920 the Central Laboratory for the Finnish Industry in Åbo[3] was requested to undertake an extensive investigation of Finnish wood pulp with special regard to the strength. The Director of this institution, G. K. Bergman, particularly interested himself in this strength test, and has ever since spent a considerable amount of energetic work in attempting to find a reliable way to test wood pulp for strength. All data given in this part of the article refer to a paper read by him at the winter meeting of the Swedish Association of Pulp and Paper Engineers in Stockholm, 1924[4].

---

*Civil Engineer, formerly with the Swedish Government Testing Institute, Stockholm, in research on pulp and paper; now studying the American pulp and paper industry on a scholarship from the Royal Institute of Technology, Stockholm, Sweden.

[1] Manager Imatra Sulphite and Paper Mills, Finland.

[2] Finsk Pappers—och trävarutidskrift, 1922, No. 4.

[3] Recently moved to Hälsingfors, Finland.

[4] Svensk Papperstidning, 1924, n:s 10-12.

The capacity of the Lampén mill soon proved unpractically small. Only one sheet, 100 x 300 mm., could be made from each beating and if this failed, the whole beating process had to be repeated. To eliminate this obvious drawback, Lampén built a larger apparatus of the following dimensions:

Ball housing:	
Diameter across the shaft	180 mm.
Diameter along the shaft	136 mm.
Total volume	2860 cc.
Free volume	1660 cc.
Ball:	
Diameter	134 mm.
Volume	1200 cc.
Weight	10.2 kg.
Revolutions per minute	300
Capacity .....wood pulp	50 grams

Principles of the Beating Process

Bergman states his opinion with regard to the beating process necessary for the strength test as follows:

"During our work in testing wood pulp for strength we have become quite convinced that the process has to be determined and standardized in all details. Every kind of stock requires individual treatment in some respects, but the method should in principle be the same for all kinds of stock and ought not to vary either for sulphite and sulphate pulps, or for soft and hard stocks. The special treatment of each kind of stock has to be defined in general. Thus the same time of beating is not to be applied to all kinds of stock, neither is it advisable to specify definite times of beating for different stocks, for instance sulphite and kraft and so forth. Instead the specifications should involve a *given degree of beating*, preferably the same for all kinds of stock. Different kinds of stock will demand various times of beating, and the beating time necessary may then be considered a measure of the hardness of the stock.

Schopper-Riegler Tester

"The Schopper-Riegler tester is based on the same principle as the freeness tester used in United States.

"In general the degree of beating is expressed in numbers from 0 to 100. With the assumption that an extremely free stock would drop all water very quickly, an extremely slow stock only very slowly, and by fixing the degree of beating for these two very limits as 0 and 100 respectively, all stages of beating may be expressed in numbers between these figures.

"These numbers, obtained by deducting from 1,000 the number of cc. water run through the overflow pipe, and dividing the rest by 10, are directly indicated on a measuring glass used for this apparatus.

"The question consequently arises to what degree shall the beating be run. Experience indicates that the strength of the paper obtained increases with the increase of degree of beating, rapidly first, then slower and slower. However, it would not be consistent with actual working conditions to push the beating too far, because, although the maximum strength occurs at imitation parchment stage (90° Schopper-Riegler[5]), the average beating in commercial papermaking is not carried on so far, and therefore we found it advantageous to stop beating at 75 degrees[6] Schopper-Riegler.

"If any acceptable reasons are found for preferring some other degree of beating, this may be adopted."

Comparative Beating Tests with Pebble Mill and Lempén Mill

In order to make the investigations for the Finnish wood pulp industry previously mentioned as complete as possible, parallel tests were made at the Finnish Central Laboratory with a Lampén steel ball mill of the bigger type and a pebble mill from the Abbé Engineering Co., as recommended by the TAPPI Committee on Standard Methods of Testing Materials used in Manufacture of Paper.

The tests, according to the American method somewhat modified, were performed in the following manner:—For each kind of stock, beatings were made employing various intervals of time, 0.5, 1, 1.5, 2, 2.5 hours, etc., and each beating completed, the degree of beating as well as the strength and ash content of the sheet formed being determined.

The general operation of the Lampén mill was as follows:—Each beating was carried on to 75° Schopper-Riegler, the degree of beating being controlled by test of samples drawn every 30 minutes, and then hand sheets were formed and tested. In order to make the comparison between the methods more complete, a whole series of strength determinations on stock beaten various intervals of time in the Lampén mill was also made in some instances.

Furnish for the Beatings

Furnish for the comparative beatings was:
Pebble mill: 100 grams wood pulp (disintegrated) 2 liters water.
Lampén mill: 40 grams wood pulp (disintegrated) 1 liter water.

Sheets, 100 x 300 mm., were formed of the various stocks in the Lampén mold, 5 grams of pulp to each sheet for the American method and 2.5 grams to each for the Finnish method. The difference in sheet weight was dictated by a desire to get results directly comparable with earlier strength determinations made with the small Lampén mill, the total capacity of which was 2.5 grams of pulp only. This caused some lower strength figures for the sheets made according to the Finnish method.

After pressing, the sheets were dried between felts at 75° Centigrade (about 165° F.) and then tested at 65 per cent relative humidity; the Pebble mill papers for bursting strength (Mullen), the Lampén mill papers for bursting strength (Mullen) and breaking length (Schopper).

"Bursting Surface"

In order to obtain a universal expression for the bursting strength, Bergman defines the *bursting surface*, analogous to the breaking length, as the *area in square meters of the paper, the weight figure of which in kilograms is the same as the bursting pressure in kilograms per square centimeter.*

$$\text{Bursting surface} = 1000 \times \frac{\text{bursting pressure in kg./cm.}^2}{\text{square meter weight in grams}} = \text{M}^2$$

To convert this figure to Wilén's points[6] (24 x 36 inch sheets) or Cameron's points[7] (20 x 30 inch sheets), the bursting surface figure must be multiplied by 2.40 and 3.48, respectively.

Result of Comparative Tests

The following results obtained by comparative test of various Finnish wood pulps by the pebble mill and Lampén methods refer to strength calculated on an ash content of the sheets corresponding to that of the unbeaten pulp.

TABLE 1

Beating time, hours	Degree of beating, Schopper-Riegler	Ash, per cent	Strength: Bursting surface, sq. meters	Strength: Bursting strength American points	Strength: Breaking length, meters
Pebble Mill					
Kraft Sulphate					
1	14.5	3.76	27.90	67.0	....
1.5	17.17	4.57	40.70	97.7	....
2	24.0	5.92	47.35	108.9	....
2.5	39.0	7.14	53.75	129.1	....
3	66.5	9.54	55.77	133.7	....
4	79.2	13.67	51.95	124.8	....
5	86.2	15.50	51.95	124.7	....
Lampen Mill					
1	14.0	....	....	....	....
1.5	20.5	....	....	....	....
2	30.0	....	....	....	....
2.5	47.5	....	....	....	....
3	57.0	....	....	....	....
3.5	66.0	....	61.35	....	7,635
4	70.0	....	....	....	....
4.5	76.0	....	....	....	....
5	79.0	....	68.20	....	8,030
6.5	85.0	....	72.65	....	8,520
8	88.0	....	73.05	....	9,125

[5] Herzberg, Papierprüfung, 5th ed., Berlin 1921, page 203.

[6] Finsk Pappers—Och Trävarutidskrift, 1921, No. 4.
[7] Pulp and Paper Magazine of Canada, 1923, No. 5.

Beating time hours	Degree of beating, Schopper-Riegler	Ash, per cent	Strength: Bursting surface, sq. meters	Strength: Bursting strength American points	Strength: Breaking length, meters
		PEBBLE MILL			
Strong Sulphate					
1	13.5	5.14	21.55	51.8	....
1.5	17.0	6.14	27.15	65.2	....
2	31.7	8.22	36.15	86.8	....
2.5	34.7	8.03	39.90	95.8	....
3	68.7	8.46	43.50	104.5	....
4	82.5	13.03	46.20	110.9	....
5	87.8	12.91	49.40	118.7	....
		LAMPÉN MILL			
1	17.5	....	....	....	....
1.5	29.5	....	....	....	....
2	44.5	....	....	....	....
2.5	61.0	....	....	....	....
3	67.5	....	....	....	....
3.5	72.0	....	....	....	....
4	75.0	....	54.84	....	6,780
		PEBBLE MILL			
Bleached Sulphate					
0.5	16.0	2.17	16.70	40.1	....
1	48.7	2.97	25.55	61.3	....
1.5	80.4	5.00	31.80	75.9	....
2	83.7	....	31.20	74.9	....
2.5	87.0	5.11	30.30	72.8	....
		LAMPÉN MILL			
1	63.0	....	....	....	4,490
1.5	70.5	....	....	....	....
2	74.0	....	26.35	....	4,835
3	83.0	....	27.75	....	4,880
4.5	87.5	....	32.45	....	4,975
		PEBBLE MILL			
Strong Sulphite					
0.5	19.3	2.37	25.10	60.3	....
1	39.7	3.84	37.05	89.0	....
1.5	70.0	6.55	47.25	113.5	....
2	84.0	7.60	51.00	122.5	....
		LAMPÉN MILL			
1	48.5	....	....	....	....
1.5	64.5	....	....	....	....
2	67.0	....	....	....	....
2.5	74.5	....	60.10	....	7,400
0	11.5	....	....	....	....
0.5	19.3	....	....	....	....
1	30.0	....	45.10	....	....
1.5	54.0	....	53.45	....	....
2	67.5	....	59.20	....	....
3	78.3	....	59.30	....	....
4	83.3	....	60.20	....	....
5	84.5	....	61.25	....	....
		PEBBLE MILL			
Bleachable-Sulphite					
0.5	18.2	2.28	21.60	51.9	....
1	36.5	4.20	31.25	75.3	....
1.5	63.7	6.76	42.90	103.0	....
2	79.2	6.68	42.65	102.4	....
2.5	87.0	7.86	47.20	113.3	....
		LAMPÉN MILL			
1	39.0	....	....	....	....
1.5	66.0	....	....	....	....
2	68.5	....	....	....	....
2.5	75.0	....	56.00	....	7,190
		PEBBLE MILL			
Bleached Sulphite					
0.5	68.9	1.23	17.70	42.5	....
1	81.2	1.88	23.50	56.4	....
1.5	89.0	3.04	27.85	66.5	....
		LAMPÉN MILL			
1	48.0	....	....	....	....
1.5	59.0	....	....	....	....
2	66.5	....	....	....	....
2.5	81.0	....	19.80	....	4,195

Discussion of the Results

The following conclusions may be drawn in respect to strength, as indicated by the bursting test:

1. At the same degree of beating, pulp beaten in the Lampén mill gives stronger paper than pulp beaten in the pebble mill.

2. The strength of the paper obtained by beating in the Lampén mill steadily increases with the degree of beating of the stock.

3. The strength of the paper obtained by beating in the Pebble mill frequently reaches a maximum and then decreases with further beating.

This remarkable difference in results between the American and Finnish methods is apparently due to a defect of the pebble mill, that has probably hitherto been overlooked. As the table indicates, *the ash content of the stock is constantly increasing in the pebble mill during the beating,* and it is a well known fact that mineral fillings decrease the strength of a paper. The increase in ash content amounts to 2.9 per cent per beating-hour as an average, ¾ of which at least is, according to Bergman, derived from the pebbles, the balance from the housing.

The difference in results would in all probability have been still more apparent, had the beating process been studied by folding endurance tests on the sheets formed, as this kind of test is particularly sensitive to mineral loadings of the paper; 10 per cent ash may cause a decrease in folding endurance of 50 per cent.

An analysis of the pebble mill beating will thus give the following facts. The increase in strength during continued beating is counteracted by an increase in ash content of the stock, originating from the pebbles and porcelain lining of the jar. When the ash imparted to the stock has reached a certain amount, this will balance and at continued beating even exceed the effect of further increase in degree of beating, thus cerating a maximum in the strength curve.

The amount of mineral matters imparted to the stock according to Bergman, is surprisingly large, and further investigation is desirable. However, *this defect makes the pebble mill objectionable in principle and inapplicable at least for tests involving long beating time.*

I will revert to this matter later on in connection with suggestions on standard methods.

TABLE 2

Beating to 75 degrees Schopper-Riegler

Bleach required by stock, per cent	American method: beating 50 minutes: Degree of beating, Schopper-Riegler	American method: beating 50 minutes: Bursting surface, square meters	Pebble Mill: Beating time, hours	Pebble Mill: Ash, per cent	Pebble Mill: Bursting surface, square meters	Lampen Mill: Beating time, hours	Lampen Mill: Bursting surface, square meters	Lampen Mill: Breaking length, meters
			SULPHATE PULPS					
Kraft								
13.20	13.5	25.8	3.48	11.7	55.1	4.44	66.8	7,900
Strong								
8.73	13.0	20.3	3.47	11.6	45.5	3.75	50.0	6,800
Bleachable								
4.38	27.0	22.0	1.31	4.2	31.0	1.80	24.8	4,700
			SULPHITE PULPS					
Strong								
7.99	30.0	34.5	1.56	6.6	47.8	2.49	60.1	7,400
Bleachable								
3.74	32.0	28.0	1.81	7.2	42.6	2.48	56.0	7,200
Bleached								
0.24	79.0	22.0	0.67	1.5	20.2	2.29	19.2	4,150

The Various Beating Methods Applied to Different Grades of Pulp

The following interesting items, published by Bergman, give a fairly good comparison between (a) the original American method, (b) the same method modified as per Finnish conditions and (c) the Finnish method.

This confirms the statement that the ash content of the stock increases steadily during the beating in the pebble mill, and this approximately in a constant ratio to the beating time.

The result confirms also Bergman's opinion that different beating times must be stipulated for various kinds of pulp.

Ratio Between Bursting Surface and Breaking Length

Bergman has made an attempt to interpret the ratio between the bursting surface and breaking length, that merits attention. He

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anticipates that there must be some connection between these two expressions and, the bursting surface representing a square quantity, the breaking length a linear quantity, he compares the square root of the bursting surface figure with the breaking length figure.

He has found that 1000 x $\sqrt{\text{bursting surface figure}}$ approximately corresponds to the breaking length in the machine direction. As a matter of fact the bursting strength, as obtained by the Mullen tester indicates mainly the strength in the machine direction on account of less elasticity in this direction.

TABLE 3

Paper	Bursting surface, square meters	Breaking length, meters	1000 x $\sqrt{\text{burst. surface}}$	Deviation per cent
Sulphate paper (handmade)	26.35	4835	5133	+ 6.2
	54.84	6780	7406	+ 9.2
	70.10	8560	8371	— 2.2
Sulphite paper (handmade)	19.80	4195	4450	+ 6.1
	56.00	7190	7483	+ 4.1
	60.10	7400	7754	+ 4.8
Sulphate paper (machinemade)	37.00	5675	6083	+ 7.2
News (medium of 18 specimens)	13.77	3785	3711	— 1.95

III. SUGGESTIONS ON STANDARD METHODS

The TAPPI Committee on Paper Testing[8] state its opinion on the purpose of paper testing as follows:

"The testing of paper is performed for three reasons, and it is possible that methods suitable for one purpose may not be suitable for another. These purposes are: (a) to study the manufacture in order to improve the quality, (b) to maintain a predetermined quality, and (c) to determine whether the quality is equal to a predetermined standard or specification. The manufacturer is interested chiefly in (a) and (b), while the user or buyer is interested in (c), when the paper is bought on specification. It is obvious that various methods may be developed for use in mills that are entirely satisfactory for the development of quality and for maintaining that quality. It is thought, however, that the methods used by testing laboratories in connection with the purchase of paper on specifications, should be so defined and standardized that comparable results will be obtained by different laboratories."

This declaration with regard to the purpose and necessity of paper testing may in the main be directly transferred to the conditions of testing wood pulp.

The pulp manufacturers, who are not directly connected with the paper mills, converting their pulp, as for instance at the bulk of the Scandinavian and Finnish mills, which produce for export exclusively, are in great need of a method that would enable them to study the strength of their pulp and to control its manufacture in a scientific manner; while the paper makers, who are compelled to purchase their supply of pulp, would welcome a reliable method that would, better than the present rough-and-ready way testing, permit them to investigate the various pulps offered, and to choose the most suitable for their purposes.

The need of standardization of testing wood pulp for strength is obvious, but the way for accomplishing this standardization is not so obvious.

I would suggest adopting two different methods, one "mill test" and one "official test," the former to be used particularly in the mills for the study of the manufacture, the latter to be used by testing laboratories in determination of the strength of different pulps intended for sale.

This proposal is based on the following reasons. Every pulp manufacturer wants his raw material treated in such a way during the manufacturing process, that the ready made pulp will give paper as strong as possible in each case. The strength of the pulp obtained from a certain raw material depends principally on the methods of cooking and bleaching used, and the strength of the paper made from a certain pulp depends mainly on the beating applied. A method for testing the strength accordingly must enable the manufacturers to study not only the influences of variations in cooking and bleaching conditions on the strength of the pulp obtained, but also the ratio between beating time and strength, to calculate the most economical time of beating.

A test from this point of view must ensure sparing the strength of the fiber as far as possible, and the beating is thus in this case advantageously executed in a ball mill.

Besides this test, intended for the mills, there is apparently another strength test necessary for all trading in wood pulp. This official test, to be executed by impartial chemists for the classification of the various pulps sold on the international market, must be thoroughly defined and standardized in all details, covering beating, sheet making and testing. A test from this point of view must conform as far as possible to commercial paper making, and the beating has thus to be performed in a hollander. The time of beating should be fixed for each kind of stock empirically as the average interval necessary to obtain a beating effect corresponding to that in the mill.

I will here outline the details of the methods suggested.

A. Mill Test for Strength

1. BEATING.

The beating will to advantage be performed in a Lampén steel ball mill, as a suggestion to 75° Schopper-Riegler at 70° F. The Schopper-Riegler tester indicated as an average the following degrees of beating, according to Bergman:

Water	4°– 5°
Unbeaten wood pulp	12°–16°
Beaten wood pulp	16°–94°

Beatings are made various intervals of time, and for each particular time, the beaten stock is tested for degree of beating and strength. The time of beating necessary to reach 75° Schopper-Riegler is noted and used as a measure of the hardness of the pulp.

The pebble mill is evidently objectionable for use in this test, intended for beating up to high degrees, as mineral matters imparted to the stock from the pebbles would cause unreliable and misguiding results.

2. SHEET MAKING.

The best sheet mold proposed seems to be the Bureau of Standards type, which gives uniform sheets, 10 to 12 inches, and enables handling in a rapid way. A complete description of the construction and operation of this apparatus was published in the PAPER TRADE JOURNAL, November last year[9]. The various details of the operation proposed may be followed strictly, if precaution is taken that all dilution and agitation of the stock be executed before pouring into the deckle box.

As regards the thickness of the sheet, both Cameron[10] and Bergman have found a square-meter weight of about 150 grams (ream weight, 60 lb., 20 x 30 inches) most convenient.

3. PRESSING.

The pressing of the sheet may be standardized to the use of hand-operated or, better hydraulic presses, in which the sheets are pressed between felts and metal plates. The pressure must be fitted with gages and the pressure kept constant during the pressing. As regards the most favorable pressure, Cameron[10] states this will be about 200 lb. per sq. in., as most stocks at that pressure show approximately the same increase in strength at the same variation in pressure. However, facilities for pressing at such high pressures are not always available at the mill laboratories, and it would therefore probably prove advisable to fix a lower pressure as standard.

4. DRYING.

Steam driers, for instance hot plates fitted with covers, will prove suitable for this method. I take the liberty to cite a description

[8] "Paper Testing Methods," New York, 1922.

[9] Shaw and Bicking, Method of making uniform fiber sheets for test purposes, Paper Trade Journal, Nov. 20, 1924.

[10] Pulp and Paper Magazine of Canada, 1924, No. 3.

of the operation of such a drier, successfully used at an American mill:

"The sheet is placed smoothly upon the hot plate, the cover carefully lowered and then immediately raised. Reverse the sheet surface, lower and raise cover exactly as before. Repeat for each side as above after which the cover is allowed to remain for longer intervals of time, 3 to 5 seconds. Continue and reverse until completely dry. Make sure that all sheets are sufficiently dried by subjecting them to a little longer drying period rather than not too long."

The drying is evidently very rapidly done in this way.

5. Testing of the Finished Sheet.

A discussion of the tests to be applied is desirable. In addition to bursting strength and breaking length, tearing strength and folding endurance should also be taken into consideration. Further the testing operations must be specified in detail to secure uniform results.

B. Official Test for Strength

1. Beating.

As previously pointed out, the beating must in this case as far as possible be a true average copy of the mill beating. It is a well known fact that the miniature beaters available at present are not accurate enough to permit standardization of a beating test. However the Paper Section of the Bureau of Standards, being greatly interested in this problem, has ordered special manufacture of a 2 pound experimental beater for this purpose and has well grounded expectations that this will prove successful. The Bureau expects to have the machine at any time and will then start an investigation as to the possibilities of standardization of the beating process.

The beater is fitted with a special lightering device as well as with a micrometer adjustment of the roll, which permits beating at a predetermined pressure and at a predetermined space between roll and plate. A repeatedly carried out beating operation will in this way produce a practical duplicate of the prior beating operation.

If this machine proves satisfactory, as one dares hope, *it will just be the beater searched for with regard to the above "official" strength test.* The standardization will then follow step by step. Having in mind that the beating conditions must conform to those of the commercial paper making, the various beating data, concentration, pressure and time etc., most suitable for beating different kinds of stock, will be empirically fixed in all respects.

2-4. Sheet Making, Pressing and Drying.

As previously mentioned, the purpose of the "official" test would mainly be a comparison between the different competing pulps sold on the international export market. This demands extreme accuracy of the method, and all inherent defects of the methods suggested up to the present, must be eliminated as far as possible before the final standardization.

One of the defects intimated is the present way of drying the sheets. In principle all drying by heat is objectionable, as it may cause deterioration of the cellulose itself. I have had opportunity to study the influence of drying in some instances by measuring the increase in copper number of the fiber material. Pure waterleaves of cotton linen and bleached sulphite, dried at 60°-70° C. for approximately 15 hours, showed the following figures:

COPPER NUMBER

	Originally	After drying	Increase
Cotton	0.33	0.60	0.27
Linen	0.69	1.08	0.39
Bl. sulphite	2.25	2.43	0.18

This is long time for drying, but any drying by heat must evidently be avoided in principle.

I would instead suggest adopting of the following method of air-drying, as used at the Government Testing Institute of Sweden.

If a sheet of paper, just formed, is permitted to dry free in the air, wrinkling will not fail. This may, however, readily be prevented, if only the sheet before pressing and drying is firmly pressed on a sheet of paperboard, previously dampened. Glazed sulphate board of 0.25 mm. thickness (0.01 inch) has proved favorable for this purpose. The dampening of the board sheets is advisably performed by dipping them into water some minutes and storing them over night several together after the excess of water has been pressed out. A sheet may be used about 25 times before being rejected.

According to the application of the board sheet to the waterleaves, the following is the modus operandi.

First the sheet is formed on the Bureau of Standards mold as suggested before. This being done and the parts of the machine separated, the sheet is covered by a napless felt over which is placed a zinc plate. The plate is carefully pressed by hand against the felt, to press out some of the water, then removed and replaced by a damp board sheet, cut slightly larger than the fiber sheet. The pressing with the zinc plate is repeated, and the board together with the adhering fiber sheet loosened from the wire, if necessary by turning the frame upside down.

The "duplex sheet" is hydraulically pressed between felts at 200 lb. sq. in. and afterwards hung up on a cord by means of clothes pins. When dry, after 4-5 hours, the sheets may easily be separated, and a perfectly even paper sheet is obtained.

5. Testing of the Finished Sheet.

A perfectly reliable strength test must be used in this official method. As the determination of the tensile strength is a more accurate test than the Mullen test and perfectly independent of the personal influence of the operator, the breaking length might be adopted as a general comparative measure of the strength of wood pulp. However, as the bursting strength is of particular interest for papers manufactured from kraft pulp, such as wrappings, the Mullen test might to advantage be used as a complement test for this kind of stock.

IV. SUMMARY

Attention is drawn to Finnish efforts to standardize a strength test for wood pulp, and description is given of a Finnish steel ball mill, constructed for this purpose. Comparative tests between American and Finnish beating methods are reported, showing that the pebble mill beating is inapplicable for long time beating tests on account of mineral matters imparted to the stock from the pebbles.

Following a discussion of the need and purpose of strength tests for wood pulp, two different standard methods are suggested, a "mill test" and an "official test," the former intended for control and study of the pulp in the mills, the latter intended for classification of various pulps sold on the international export market. The performance of these two tests is outlined in detail, and a method of air-drying handmade sheets is given in this connection.

The kind assistance of B. W. Scribner and other members of the Paper Section of the Bureau of Standards in preparing this article is gratefully acknowledged.

United Paperboard Co. Wins Rate Case

Schuylerville, N. Y., July 20, 1925.—By a decision of the Interstate Commerce Commission handed down last week the United Paperboard Company, of Thomson, is the winner in its case against the Greenwich & Johnsville Railway Company, a subsidiary of the Delaware & Hudson. The United Paperboard Company was awarded a refund of $341.91 for over-payments on carloads of wood pulp shipped to Whippany and during February, March and April, 1921 the Thomson plant was temporarily closed and six carloads of wet wood pulp were shipped to the Whippany plant at the rate of 35.5 cents per 100 pounds. The United Paperboard Company claimed that the rates should have been 25.5 and in February 1922 filed a complaint with the Interstate Commerce Commission. An investigation was conducted and briefs filed by both sides.

The decision of the Commission declares that the rate should have been 28.5 cents a hundred before June 1, 1922 and 25.5 cents after that date and that the Paperboard Company was entitled to a refund of $341.90 with six per cent interest from April 19, 1921.

Possibility of Pulping with a Mixture of Lime and of Sodium Sulphate*

By M. Brot and H. Men.

The pulping of plants with caustic soda is carried out by cooking for a time varying from 2 to 8 hours at a pressure of from 2 to 10 kilos (about 27 to 135 pounds per square inch), and requires anywhere from 5 to 35 per cent of caustic (calculated on the weight of the raw material) according to the nature of the material being treated, the liquor being used at a concentration of 1 to 8 per cent.

The caustic soda, which is the disincrusting or delignifying agent by means of which the cellulose is isolated or separated from the other constituents, can be obtained in different ways:

1) By causticizing soda ash by means of slaked lime. This is the process by means of which most of the commercial caustic is produced.
2) By electrolysis of common salt (sodium chloride). The caustic is obtained directly from the cells in the form of an aqueous solution containing some undecomposed sodium chloride.
3) When sodium sulphate is heated to a high temperature with an excess of organic matter there is formed a mixture of sodium carbonate and sodium sulphide. When this mixture is causticized with lime there is formed a mixture of sodium sulphide and caustic soda, which is used for cooking straw or wood in the socalled sulphate process.

Owing to the cheapness of sodium sulphate, this process is being applied to a considerable extent and is developing quite rapidly; but it possesses the great drawback that there are given off gases with a very penetrating and very disagreeable odor.

Commercial Sodium Sulphate

Sodium sulphate occurs naturally in fairly large quantities and is quite widely distributed, either as thenardite, which contains from 97 to 99 per cent of anhydrous sodium sulphate, as Glauberite, $Na_2SO_4.CaSO_4$, which is found in large quantities at Stassfurt, or as Glauber's salt, $Na_2SO_4.10H_2O$, which is found in numerous mineral waters, as well as in the mother liquors of salt marshes.

It is also obtained as a byproduct in several important commercial processes, for instance in the Leblanc process and also, along with hydrochloric acid, in the Hargreaves-Robinson process. In the manufacture of nitric acid from nitrates there is produced a considerable amount of niter cake, or sodium bisulphate, as a byproduct. During the war this hygroscopic product was very troublesome to dispose of; and even at the present time it is not utilized to any extent, in spite of the numerous uses which have been suggested for it.

Conversion of Niter Cake Into Neutral Sulphate

Sodium bisulphate contains about 35 per cent of free sulphuric acid. By dissolving it in water and treating the solution with finely ground limestone, an impure sodium sulphate solution is easily obtained, which would be suitable for pulping plants or wood.

On account of the large quantities of byproduct sodium sulphate available, the price is very low, frequently only half that of common salt; while niter cake is even cheaper as most of it is simply thrown away at the present time.

Cost of Soda in Pulping

In the ordinary soda and kraft processes, the cost of sodium salts amounts to at least 5 to 7 per cent of the total cost of the pulp, while it amounts to at least 20 to 25 per cent when there is no recovery of the alkali.

Most soda (or sulphate) pulp is manufactured in regions where sodium sulphate or carbonate is produced, or where there are electrolytic soda works.

Treatment of Exotic Plants

Many exotic trees and plants have been suggested, and are still being suggested, for the manufacture of pulp. A cursory investigation soon shows that in all but a very few cases the cost of transporting these materials to existing pulp mills would be prohibitive; and it is only by appropriate treatment at or very near the place of growth that there is any chance of making these materials available in the near future.

But the erection of a pulp mill in such places constitutes a very difficult and complicated problem, suitable water supply and an adequate fuel supply must be found; soda ash would be very expensive on account of high transportation charges; installation of an electrolytic plant cannot be carried out unless there is an electric generating station, and moreover it is delicate to operate; on the other hand the sulphate process requires the erection of an expensive mill.

Such attempts have been made on several occasions, both in Algeria and in Tunis, with a view producing either cellulose or a crude halfstuff which could be subsequently worked up into material suitable for paper making. But none of these ventures were successful.

It will be readily understood that the use of such a widely occurring material as sodium sulphate might perhaps in some cases give very interesting results.

Chlorine Processes

These processes, which are based on the same principle as the well known Cross and Bevan method for the analytical determination of cellulose, are suitable for the treatment both of grasses, such as straws or esparto, and of wood. They are not applicable in practice unless there is available a supply of cheap electrolytic chlorine and caustic soda.

In certain cases the material is subjected to relatively drastic alkaline treatment (before chlorination) with from 8 to 14 per cent of caustic soda; while in other cases the cellulosic material is treated with a small amount of alkali corresponding to about 2 per cent of the weight of the material. In the first case a considerable proportion of the work of isolating the cellulose from the incrustants is accomplished by the alkali. As electrolysis of sodium chloride gives approximately equal weights of chlorine and caustic soda, it is evident that the complementary chlorine treatment (chlorination and bleaching) will not require all the chlorine produced.

In certain cases there might be a possibility of utilizing the excess of chlorine for the treatment of materials which had been given a preliminary cooking with a mixture of lime and sodium sulphate, provided the latter were obtained very cheaply, as, for instance, in the form of niter cake.

On the whole, the causticizing of sodium sulphate by lime, which seems to require high pressures, can be tackled much more easily at the present time than it could have been fifty years ago. At the present day autoclaves can easily be constructed to work without trouble at pressures of 50 to 100 kilos (about 650 to 1300 pounds per square inch). In the Haber process pressures of 150 to 200 kilos are used regularly, while 900 to 1,000 kilos are being used in the Claude process for the synthesis of ammonia.

Experimental Work

These considerations induced us to make a few cooking tests with a lime sodium sulphate mixture with the rather limited equipment at our disposal in the Laboratories of the French School of Paper Making.

We used as autoclave a plain cylindrical steel tube, tested to a pressure of 250 kilos, and provided with a device for filtering under

*Translated from *Le Papier* xxvii, 1123-1129, October 1924, by A. Papineau-Couture.

pressure. This tube, which had a capacity of about 250 cc., was hermetically closed by means of a special cover with three clamping screws. It was heated externally by placing in an air oven which could easily be heated up to 200°C.

Raw Materials

The lime used was very pure and was completely soluble in hydrochloric acid. It was stored out of contact with the air, and was slaked after weighing. The sulphate was pure crystallized Glauber's salt, $Na_2SO_4 10H_2O$, free from chlorides. The cellulosic material consisted of a 12-kilo lot of very fine rye straw, which had an average moisture content of 10.5 per cent. It was cut and, after removing the nodes, was dried to constant weight at 100° to 110°C. The cellulose content of the oven-dry straw can be taken as being approximately 50 per cent.

Nearly all of our numerous experiments were carried out under strictly uniform temperature conditions; and we verified that at 180° to 185°C, no gases are evolved, this temperature corresponds to a pressure of 10 kilos (about 130 to 135 pounds per square inch). Ten grams of dry straw, 200 cc. of water or of solution, and 3 grams of quicklime (slaked after weighing) were placed in the tube and cooked for 2 hours. The autoclave was then cooled down rapidly and the pulp was separated from the liquor on a felt. The pulp was taken up with 1,000 cc. of water and 10 cc. of cold concentrated hydrochloric acid, mixed thoroughly, thrown on a felt, and washed with a large quantity of water until neutral to litmus.

Tests with Lime Only

Three tests run with 3 drams of lime and 10 grams of straw gave yields of 67, 66, and 66.5 per cent, average 66.5 per cent.

This shows that results can be duplicated within 1 per cent, which is quite good for pulping tests and cellulose determinations. We have found that all our results could be duplicated within 1 per cent, provided the temperature of the air oven was regulated to within 2 degrees, which requires quite a little care.

Tests with Lime and Sodium Sulphate

The causticizing of sodium sulphate can be represented by the equation

$$Na_2SO_4 + Ca(OH)_2 = CaSO_4 + 2NaOH.$$

142 grams of anhydrous sodium sulphate or 322 grams of Glauber's salt correspond to 56 grams of quicklime, so that 18 grams of Glauber's salt correspond to 3 grams of lime.

The average results obtained were as follows:

Lime	Sodium Sulphate	Yield
g.	g.	%
3	5	63
3	15	59
3	20	55.5
3	40	41.5
3	60	40.5
3	80	38
3	120	40

The yield decreases as the amount of caustic formed increased, and the results show that the maximum amount of caustic produced corresponds to the use of 60 grams of Glauber's salt, that is, to about three times the quantity equivalent to the 3 grams of lime added. Under these conditions it is therefore necessary to have a considerable excess of sulphate to obtain maximum caustification.

It can be noted also, and we verified it by several tests which gave concordant results, that the excess of sodium sulphate tends to interfere with the action of the caustic soda, so that on plotting the yield against sodium sulphate the curve reaches a minimum value and then rises again slightly. The presence of small amounts of calcium sulphate, on the other hand, does not seem to have much effect, or at least it does not prevent excellent duplication of results.

The color of the pulps obtained varied from brownish yellow to very light yellow. On the whole, they are very difficult to bleach under normal bleaching conditions; but in a few instances they could be bleached with but little more trouble than the ordinary pulps.

We did not go very deeply into this aspect of the question; but we are inclined to think that bleachable pulps could be obtained by increasing the time of cooking and the concentration of the liquor.

Disregarding the question of bleachability for the time being, we wished to have some means of judging of the value of the lime sodium sulphate mixture, so we ran comparative tests under exactly the same conditions, but using a lime soda ash mixture in one series and caustic soda alone in another series.

Tests with Lime and Soda Ash

As before 10 grams of straw, 3 grams of lime and increasing amounts of soda ash were cooked for 2 hours at 180°C.

Soda Ash		Average Yields
g.	%	%
0.7	7	56.5
1.45	14.5	47.5
2.85	28.5	40
5.7	57	36
11.4	114	31

Tests with Caustic Soda Alone

Similar tests with caustic soda gave the following results:

Weight of 70% NaOH Added	NaOH on Straw	Average Yield
g.	%	%
0.72	5	Spent Liquor Acid in Reaction
1.45	10	55
2.90	20	42.5
6.10	43	37

These experiments show that, when cooking under the same conditions, a mixture of lime with 20 grams of sodium sulphate gives approximately the same yield as 10 per cent of caustic soda or as lime with 7 per cent of soda ash.

Pressure and Causticizing

In order to have some idea of the effects of pressure on yield, we cooked 10 grams of straw for two hours with 3 grams of lime and 40 grams of Glauber's salt, the total volume of solution being 200 cc.

Pressure	Yield
	%
Partial vacuum (160 mm. absolute)	90
Atmospheric pressure (755 mm.)	76
5 kilos	47.5
10 kilos	41.5

The yield is thus seen to decrease with increase in pressure; but unfortunately we could not go above 10 kilos (180° C.) because cellulose begins to decompose at a temperature of about 200°C. Experiments with hydrostatic pressure, which would allow of cooking at lower temperatures and very high pressures, would certainly give peculiar results. We were not in a position to work under these conditions; but we shall try to equip ourselves to carry on the work along these lines at some future time.

Concentration

It is very difficult, when working on such a small scale as we did, to steam the straw, and we had to work with rather dilute liquors. We used 200 cc. of liquor for 10 grams of straw while in commercial practice about 200 to 250 liters of liquor are used per 100 kilos.

It is quite reasonable to suppose that in practice the stronger liquor would give a more easily bleached pulp.

Practical Conclusions

An almost completely disincrusted cellulose can be obtained by cooking straw at a pressure of 10 kilos with a mixture of lime and sodium sulphate. It is quite likely that a bleachable pulp could be obtained by increasing the time of cooking and concentration of the liquor. The proportions of lime and of sodium sulphate required are high, and the process is practical only provided that a by-product sulphate could be procured at a negligible cost.

As we have already explained at the beginning of the article, the process would doubtless furnish a means of utilizing niter cake, after neutralization with limestone.

Theoretical Considerations

Retarding Action of Sodium Sulphate. The curve obtained by

plotting yield against amount of sodium sulphate shows quite clearly that there is a maximum to the delignifying action of the lime sodium sulphate mixture. We verified this experimentally by running a few tests with caustic soda to which we added sodium sulphate. By adding 40 grams of Glauber's salt to 1:45 grams of 70 per cent sodium hydroxide we obtained an average yield of 59 per cent which is appreciably higher than the 55 per cent yield obtained by using 1.45 grams of 70 per cent caustic without addition of sulphate. A considerable excess of sodium sulphate can therefore be expected to interfere with the action of the caustic.

Retarding Action of Sodium Chloride. Owing to analogy with sodium sulphate, and in view of the fact that electrolytic soda solutions contain more or less sodium chloride, we ran a similar series of tests with varying quantities of this salt. Operating under the same conditions as before we obtained:

With 1 g. NaOH (1.45 g. of 70% NaOH) a yield of 55 per cent;
With 1 g. NaOH and 5 g. NaCl a yield of 56.5 per cent;
With 1 g. NaOH and 10 g. NaCl a yield of 58 per cent.

Sodium chloride is thus seen to exert a retarding action also, which is of the same order of magnitude as the action exerted by sodium sulphate. This is due to the well known phenomenon of homoionic action, by which the ionized caustic soda molecules are converted into neutral molecules. But this action becomes of practical importance only with very high proportions of salt, much higher than are found in electroyltic soda solutions.

Action of Sodium Chloride on Lime

We also ran a few experiments with mixtures of lime and sodium chloride to ascertain the effect of the latter. As was to be expected, no interference was noted, and the addition of increasing amounts of sodium chloride to the lime in no way affected the yield, which in every case was from 66 to 67 per cent, as when lime alone was used.

Calculating the Concentration of Caustic Soda

The actual concentration of caustic soda in the cooking liquor can easily be calculated with a fair degree of approximation from the above experiments. As practically the same results were obtained by cooking either with 1.45 grams of 70 per cent caustic, or with 3 grams of lime and 20 grams of Glauber's salt, or with 3 grams of lime and 0.7 gram of soda ash, it can be inferred (disregarding the retarding action of the sodium sulphate) that about 0.6 gram of sodium hydroxide was formed by caustification of the sulphate; and as there is 200 cc. of liquor the concentration is approximately 3 grams per liter.

By similar experimental comparisons, the caustic soda concentration in the various tests described above can easily be found out.

In a subsequent article we intend showing that this comparative method of determining the degree of alkaline hydrolysis at atmospheric or other pressure can be extended to the case of other water soluble salts. It is less accurate but much simpler than the electromotive force method, the method by determination of the velocity of saponification of methyl acetate, or the method by determination of the rate of decomposition of nitroso triacetone amine.

Conclusion

We conclude from these tests, which, it is true, were carried out under rather rudimentary conditions, that cooking cellulosic materials, and more particularly straw, with a mixture of lime and sodium sulphate can give a pulp suitable for the manufacture of paper; and that such a process would offer a more promising outlet for niter cake than the other uses which have been suggested for this product.

Moreover, we have shown that the presence of a large excess of sodium sulphate exerts a retarding action on the caustic soda during the cooking of straw, and that sodium chloride exerts a similar action; but the proportion of sodium chloride present in electrolytic soda solutions is too small to exert any appreciable effect on the yield of pulp.

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Finally, comparative tests carried out on a given cellulosic material can be made the basis of a new method of determining the degree of alkaline hydrolysis of water soluble salts, which method is less accurate but much simpler than current methods.

Laurentide Shows Excellent Paper Mill Records

Production and Machine Crew Efficiencies for the Month of June and for Six Months—Cumulative.

	Month		Cumulative	
	Production	% Efficiency	Production	% Efficiency
Machine No. 2	33.9	93.5	34.1	93.3
" " 3	22.2	92.3	22.2	92.6
" " 4	34.4	94.7	33.0	92.9
" " 5	34.3	93.5	33.4	91.5
" " 6	39.8	90.6	36.6	94.2
" " 7	29.0	93.8	28.3	92.6
" " 8	87.1	93.4	85.6	91.8
" " 9	86.1	92.4	85.0	91.3
Total	366.8	92.9	358.2	92.2

Production Per Square Foot of Wire or Per Pound of Drier Felt Cumulative From January 1, 1925.

A wire 103 feet long running at 1,000 feet should last longer than one 75 feet long running at the same speed, since it will make fewer trips around the fourdrinier per hour and pass fewer times over the suction boxes in each day's run. If it does not last longer than the 75 foot wire it will not make as much paper per square foot as the 75 foot wire and will therefore be more expensive to run. For this reason we prefer to consider the performance of our wires in "pounds of paper made per square foot of wire" rather than in "days run."

The figure is obtained by dividing the total number of pounds of paper made in a certain period on each machine by the total number of square feet of wire put on the machine during the same period.

The same thing holds true of drier felts. We prefer to consider the production of paper made per pound of drier felt used; since machines running at different speeds and using drier felts of different weights (6/o, 8/o, 12/o, Siamese, etc.) cannot be accurately compared on the basis of "days run."

Production of Paper per pound of wire and per pound of Drier Felt.

	Wires Pounds	Drier Felts Pounds
Machine No. 2	2628	2694
" " 3	1720	3405
" " 4	2740	3234
" " 5	1484	2370
" " 6	2342	4329
" " 7	1760	3719
" " 8	3129	2236
" " 9	3006	2695
Average	2424	2770

(From The Journal, Grand Mere Tale, Inc., July 11, 1925.)

Scandinavia Pulp Markets Quiet

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., July 22.—Both the pulp and paper markets of Norway are quiet according to a report to the Paper Division of the Department of Commerce from Oslo. Prices of mechanical pulp are unsatisfactory the report states and exporters are holding off for better prices. The 1925 production of kraft paper is practically sold. During the period January-March, 1925, Norwegian paper exports were valued at $5,894,260 as compared with $3,289,840 during the same period of last year.

Current Paper Trade Literature

Abstracts of Articles and Notes of Papermaking Inventions Compiled by the Committee on Abstracts of Literature of the Technical Association of the Paper Making Industry

Clarence J. West, Chairman

Waste Paper

Recovery of Fatty Substances Contained in Old Paper. Fritz Kempter. Ger. pat. 405,218. *Papierfabr.* 22, 562 (Nov. 23, 1924). The comminuted waste paper is placed in a container with hot water and given a stirring motion. The molten fat rises to the top of the suspension and the fibrous material is kept from the surface by a screen. The liquid layer of fat may be easily removed in this manner.—J. L. P.

Removal of Printing Ink from Paper. Guido Ruffert. Ger. pat. 401,145. *Zellstoff U. Papier* 237 (Sept., 1924). Printed paper is treated with anhydrous solvents, as pyridine or piperdine, to facilitate the removal of the ink.—J. L. P.

Deinking Printed Paper. L. E. Granton. Eng. pat. 222,160. The paper is pulped in a solution of alkali or alkaline reacting substances, such as silicate of magnesium, finely divided clays and protective colloids which have adhesive properties.—A. P. -C.

Deinking Waste Paper. P. Bourcet and H. Regnault. Eng. pat. 219,311, July 15, 1924. The removal of the insoluble pigments, freed by solution of the oily vehicle, is effected by washing the pulp in a drum washer instead of using a liquid insoluble in water to entrap the pigments, as described in Eng. pat. 198,854.—A. P. -C.

Paper Deinking Processes Which Are Subjects of Patents. *Paper* 35, 509-510 (Jan. 8, 1925). Brief review of the chief American, English and German patents issued within the last few years. A. P. -C.

Paper Deinking Process. Paul Bourcet and H. Regnault. Fr. pat. 580,624; addition to 559,897. The patent specifies the use of a washing drum for removing the ink from the fibrous mass after the ink has been dishered from the fibers in the manner specified in the chief patent.—A. P. -C.

Improved Waste Paper Pulper. Ortenbach and Vogel Maschinenfabriken A. G. Fr. pat. 581,043. In the usual type of waste paper pulper provision is made for introducing hot water at the waste paper inlet. In order to obtain the benefit of the action of hot water throughout the entire length of the machine means are provided for steam heating the machine at suitable points along its length, either directly or indirectly. By increasing the pulping temperature the power consumption can be correspondingly lowered.—A. P. -C.

Sulphite Process

Sulphur or Pyrites—Which? Rudolf Sieber. *Pulp & Paper* 22, 739-742, 751-752 (July 17, 1924). See *Pulp & Paper* 22, 1158 (Nov. 13, 1924); *Paper Trade J.* 79, No. 14, 50 (Oct. 2, 1924).—A. P. -C.

Process of Gas Cooling in Sulphite Liquor Manufacture. Koholyt Akt.-Ges. Ger. pat. 401,419. *Papierfabr.* 22, 444-445 (Sept. 21, 1924). The sulphur burner gases are mixed directly with the cold sulphurous acid. An apparatus is described.—J. L. P.

Acid Tower for the Manufacture of Sulphite Liquor. Metallbank u. Metallurgische Ges. Ger. pat. 406,121. *Papierfabr.* 22, 584-585 (Dec. 7, 1924). The tower consists of one or more concentric towers, one of which contains the limestone for the manufacture of sulphite cooking liquor.—J. L. P.

Curtailing Manufacturing Costs. *Paper* 35, No. 5, 174-176 (Nov. 20, 1924). Hints and suggestions on most economical operating conditions as regards wood preparation, sulphite liquor preparation, cooking by the sulphite process, screening, bleaching and concentrating the stock.—A. P. -C.

Manufacture of Sulphite Cooking Liquors Containing Magnesium. C. G. Schwalbe and Kurt Berndt. *Papierfabr.* 22, Festheft 65-71 (June 17, 1924). A brief review, mainly of patents, is given on the manufacture of magnesium bisulphite cooking liquor. Directions are given for the manufacture of such liquors from magnesium chloride or sulphate, or waste liquors from the potash industry. They can be prepared with but little change in the present equipment and without a marked increase in cost. A report on a comparative study of calcium and magnesium bisulphite and sulphite solutions will soon be published.—J. L. P.

Gas Volume in Sulphite Liquor Manufacture. B. H. Moerbeck. *Wochbl. Papierfabr.* 55, 2397-2398 (Sept. 20, 1924). The relations between the volumes of the gases, in sulphite liquor manufacture, and the pyrite burners, the gas washers and coolers are discussed. Practical suggestions on pyrite burner operation are given. —A. P. -C.

Measurement of Liquids and Gases. Anon. *Papierfabr.* 22, 766 (Nov. 30, 1924). A self-recording venturi meter is described for measuring the flow of liquids and gases.—J. L. P.

Recovery of Free Sulphur Dioxide from Waste Liquors in the Manufacture of Pulp. Paul Knichalik. Ger. pat. 406,172. *Papierfabr.* 22, 622 (Dec. 25, 1924). Free sulphur dioxide, evolved by waste liquors in the pulp industry, is absorbed in a tower-like apparatus consisting of several compartments which are filled with lime water or fresh water.—J. L. P.

New Method of Control of Sulphite Pulp Cooking. E. Fleury. *Can. Chem. Met.* 9, 16-18 (Jan., 1925); *Paper* 35, 512 (Jan. 8, 1925); *Pulp & Paper* 23, 106 (Jan. 22, 1925). The test is based on the color developed by carbohydrates (sugars, gums, lignin) in alkaline solution, and is carried out as follows: to 50 cc. of digester liquor add 25 cc. of ammonia (1:5) and then 25 cc. of either ethyl or methyl alcohol (1:1), and filter off the precipitated calcium and magnesium monosulphites. The color of the filtrate is measured in a Hess-Ives tint-photometer. The color corresponding to the desired quality of pulp having been determined with great care, subsequent cooks are conducted so as to give the same color, and when this has been obtained the digester is ready to blow. The method is useful not only for determining the end of the cook, but also for finding when the liquor actually begins to react with the incrustants (about 105° to 110° C.) and for following the progress of the reaction throughout the cook. The test is quick, easy and cheap to carry out, and particularly suited to mill control.—A. P. -C.

Mitscherlich Test in the Cooking of Sulphite Pulp. Gunnar Pettersson. *Svensk Papperstid.* 18, 384 (1924); *Papierfabr.* 22, 613-617 (Dec. 25, 1924). A report is given on some experiments designed to show the value of the so-called Mitscherlich or ammonia test, without the use of a condenser, in the sulphite pulp cooking process. When the test liquor is blown from the digester the sulphurous acid escapes in an amount depending on the lime content of the cooking acid. The sulphurous acid left yields a precipitate on the addition of ammonia with the uncombined and combined calcium present. The more concentrated the acid, the less is the precipitation. The concentration of the hydrogen ions increases with the progress of the cook. Determination of the sulphurous acid by precipitation as calcium sulphite and estimation of the precipitate in the usual way does not give accurate results. Proper sampling and the direct titration of the sample with standard iodine solution yield more reliable figures.—J. L. P.

Sugar Formation in a Sulphite Digester—Quick-Cook Process. E. C. Sherrard and C. F. Suhm. *Ind. Eng. Chem.* 17, 194-195 (Feb. 1925). Variations in the quantity of free sulphur dioxide as ordinarily found in a sulphite digester has no appreciable effect upon

the quantity of sugars produced. Little or no sugar is formed until a temperature of 100° C. is reached, and variations in final temperature ranging from 130° to 150° C. have but little effect on the sugar yield. Judged by sugar production, little difference exists in the quick-cook process and the Mitscherlich process, except that in the former sugar formation is more rapid and the yields of sugar are considerably larger. White spruce wood gives rise to about 25 per cent more sugar than jack pine.—A. P. -C.

Investigations on the Carbohydrate Constituents of Sulphite Pulp. *I.* Hugo Krause. *Cellulosechemie* 5, 88 (Sept. 28, 1924). Controversial with Hagglund and Klingstedt, same journal 5, 57-64. The discussion centers on the Krause extraction method of determining fructose. *II.* Erik Hagglund and F. W. Klingstedt. *Cellulosechemie* 5, 88 (Sept. 28, 1924). A reply to the criticism of Krause.—J. L. P.

Manufacture of Pulp and Lignin Substances from Wood or Similar Raw Materials. Charles F. Cross and Alf Engelstad. Ger. pat. 401,418. *Papierfabr.* 22, 458 (Sept. 28, 1924). Wood is treated with a strong aqueous solution of sulphurous acid, free from sulphuric acid. The waste liquor from the treatment is freed from sulphur dioxide and sulphuric acid, and concentrated or evaporated to dryness.—J. L. P.

Process and Apparatus for the Manufacture of Sulphite Pulp. Koholyt, Akt.-Ges. Ger. pat. 404,504. *Papierfabr.* 22, 512 (Oct. 26, 1924). An apparatus is described for utilizing the heat of the waste sulphite liquor to preheat the fresh cooking acid. The heat from the residual distillation liquors, resulting from the fermentation of waste sulphite liquor, is utilized similarly.—J. L. P.

Process for the Manufacture of Sulphite Pulp. Koholyt, Akt.-Ges. Ger. pat. 404,505; addition to 404,504. *Papierfabr.* 22, 513 (Oct. 26, 1924). The preheating of fresh cooking acid, in the sulphite pulp process, is accomplished in two stages: (1) the hot residual liquors from the distillation of the fermented waste sulphite liquor, or the neutralized waste liquor, are utilized for their heat content, and (2) the waste heat from spent acid is absorbed in a suitable apparatus.—J. L. P.

Bamboo Polysulphide Pulp. C. B. Davies. *Paper* 35, 501-502 (Jan. 8, 1925). Results obtained by Stevens by Tingle's polysulphide process, more particularly greenish color and more offensive odor, are attributed to the fact that he used green bamboo, and possibly also to local overheating and absence of provision for relieving the oxygen from the experimental digester. Inferior strength of the sheet obtained by Stevens as compared with sulphate pulp sheet is attributed to neglect to remove calcium compounds from the cooked material, thereby preventing hydration of the stock to a considerable extent. Stevens' yield figures (51 per cent by polysulphide and 55 per cent by sulphate process) are questioned in the light of Raitt's results, which are 42 to 44 per cent by the sulphate process (*Indian Forest Records*, Vol. 3, Pt. 3).—A. P. -C.

Validity of Drewsen's Sulphite Process. Arthur S. M. Klein. *Paper* 35, 511 (Jan. 8, 1925). The author questions the validity of U. S. pat. 1,511,664, Oct. 14, 1924, for the treatment of straws and grasses with a solution of a soluble monosulphite followed by treatment with an acid solution, preferably sulphurous acid or a bisulphite, on the ground that the use of monosulphite has been previously patented in Europe, and was actually used successfully in mill scale trials. He also doubts the necessity of the secondary acid treatment. If Pomilio manages his processes as efficiently as de Vains from the paper makers' standpoint, he should obtain better results because in principle and in theory the process is superior to that of de Vains.—A. P. -C.

Pulping Process. Zellstofffabrik Waldhof and Franz Siegmund. Ger. pat. 406,445. *Papierfabr.* 22, 611 (Dec. 21, 1924). The sulphite acid cooking liquor is preheated in a separate container by the waste gases from a digester and also with fresh steam.—J. L. P.

Manufacture of Pulp from All Kinds of Fibrous Materials. Carl G. Schwalbe. Ger. pat. 405,950. *Papierfabr.* 22, 586 (Dec. 7, 1924). The digestion of fibrous materials is effected by the use of insoluble or difficultly soluble sulphites, the solubility of which is raised by the addition of soluble substances as sugars or salts of organic acids.—J. L. P.

Ritter-Kellner or Mitscherlich? B. H. Moerbeek. *Wochbl. Papierfabr.* 55, 2945-2947 (Nov. 15, 1924). A discussion of the Ritter-Kellner and Mitscherlich pulp processes from the standpoints of chemistry and heat utilization. By the former process packing of the chips increased the pulp yield 5 per cent. Steaming and refilling of the digester increased the yields 10 to 15 per cent. For economy it is recommended that the cooking acid be preheated with waste steam.—J. L. P.

Heat Economy in the Pulp Industry. Jakob Pfotzer. *Wochbl. Papierfabr.* 55, 3162-3163 (Dec. 6, 1924). Controversial with B. H. Moerbeek in the same journal, No. 46.—J. L. P.

Chemistry and Heat in Sulphite Work. Arthur S. M. Klein. *Paper* 35, 581-585 (Jan. 22, 1925). A concise review of published material on the chemistry of the sulphite process, on the effects of the main factors involved in the commericial application of the process and on heat consumption and economy.—A. P. -C.

Heat Economy in the Pulp Industry. A. Klein. *Wochbl. Papierfabr.* 55, 2873-2874 (Nov. 8, 1924). Controversial with R. Dieckmann in the same journal, No. 43. Heat utilization in the Mitscherlich process is discussed.—J. L. P.

Chemistry and Heat in the Manufacture of Sulphite Pulp. Arthur S. M. Klein. *Zellstoff U. Papier* 4, 318-322 (Dec., 1924). The role of chemistry and the utilization of heat in the sulphite process for producing pulp are discussed. Essentially a review of the literature.—J. L. P.

Heat Relations in the Sulphite Process for Pulp. Rudolf Sieber. *Wochbl. Papierfabr.* 55, 2798-2804 (Nov. 1); 3015-3017 (Nov. 22); 3229-3232 (Dec. 13); 3310-3314 (Dec. 20, 1924). Part of a series of articles on the heat relations in the sulphite pulp process. Numerous diagrams are employed. The following subjects are considered: specific weight of pulpwood; specific heats of dry and moist wood, and of the cooking acid; heat capacity of the structural material; pulp yields, relations of moisture content of wood and density of digester packing to yields; and cooking acid per unit of digester volume. In another article are outlined the fundamental data for calculating the heat required for the cooking process. Then the author considers the heat which is utilized for purposes other than the actual digestion of the chips, such as the heat capacity of the digester.—J. L. P.

Recovering Sulphurous Acid and Waste Heat from Waste Gases from Sulphite Digesters. H. Clemm assignor to Zellstofffabrik Waldhof. U. S. pat. 1,515,656, Nov. 18, 1924. The gas is directly withdrawn from the digester by means of a compressor and passed under pressure for further use to any desired apparatus. By the suction of the compressor the pressure within the digester is reduced below atmospheric pressure, so that a vacuum is produced within the digester and above the liquor, resulting in recovery not only of the sulphurous acid in the gas, but also of what remains in the liquor. By conveying the waste gas to the place of use under pressure, the gas, whether hot or cold, can be forced into the fresh liquor, irrespective of the level thereof.—A. P. -C.

Process for the Utilization of the Waste Heat and Gases from Digestion Processes. Ph. Nebrich, vorm. Reinicke & Jasper. Ger. pat. 405,698. *Papierfabr.* 22, 584 (Dec. 7, 1924). Two digesters are so arranged that the waste heat and gases from one are utilized by the other.—J. L. P.

Utilization of the Liquids and Gases from the Waste Gases of Pulp Digesters. Akt. für Zellstoff- u. Papierfab. Ger. pat. 405,058. The liquids and gases given off by the waste gases from pulp digesters are forced into a second charged digester.—J. L. P.

Notes on Sulphite Cooking. Bergoo. *Papier* 28, 41-44 (Jan. 1925). A discussion of the quality of pulp produced in the different types of digesters (vertical, horizontal, rotary) by direct and indirect cooking, from which the author concludes that best results are obtained with some system of forced circulation.—A. P. -C.

Interrelated Process of and Apparatus for Producing Sulphate and Sulphite Pulps. G. A. Richter assignor to Brown Co. U. S. pats. 1,519,508 and 1,519,509, Dec. 16, 1924. No. 1,519,508. Wood chips or similar raw cellulosic material are digested in an acid cooking liquor containing a soluble sodium compound, such as sulphur dioxide, sodium sulphate and sodium sulphite. Another batch of the cellulosic material is digested with an alkaline cooking liquor such as sodium sulphide and sodium hydroxide, and the waste acid liquor from one digestion is utilized as a source for the manufacture of sodium hydroxide for use in the alkaline digestion. No. 1,519,509 specifies cooking wood or similar material in a solution of sulphur dioxide and sodium sulphate and smelting the inorganic constituents of the resulting waste liquor with inorganic constituents of a waste liquor from alkaline digestion to produce soluble compounds which are used with sulphur dioxide for further digestion.—A. P. -C.

Economy of Lime Reburning. G. K. Spence. *Paper Trade J.* 80, No. 6, 223, 225 (Feb. 5, 1925); *Paper Ind.* 6, 2157-2159 (March, 1925). A discussion of its advantages and of the relative merits of coal, fuel oil, and pulverized coal under different conditions.—A. P.-C.

Wet Bark as Fuel. H. D. Bean. *Pulp & Paper* 22, 1179-1182 (Nov. 20, 1924). A discussion of the conditions under which wet bark can be converted into an "auto-combustible" fuel, with a description of the "Northern" bark press.—A. P.-C.

Utilizing the Heat of Vapors from Sulphite Cellulose Boilers with Indirect Heating. R. Karlberg. Swed. pat. 57,253, Sept. 3, 1924. The vapor is used for indirect heating of the boilers. The condensate is treated with maganese dioxide to oxidize and neutralize the acid present.—C. J. W.

Lap Stock Versus Slush Stock in Furnishing Beaters. V. E. Fishburn. *Paper Mill* 48, No. 43, 43-44 (Oct. 25, 1924). A discussion of the relative merits of the two systems.—A. P.-C.

Use of Soda Ash in Coloring Sized Papers. Walter C. Holmes. *Am. Dyestuff Rept.* 13, 561-564 (1924); *Paper Making* 43, 550-553 (Oct. 1924). The use of soda ash in the beater improves the coloring of sized papers of a variety of materials with both basic and acid dyes.—A. P.-C.

Dyeing of Paper Pulp. *World's Paper Tr. Rev.* 82, 1150, 1152, 1154 (Oct. 3, 1924). General information on the application of acid, cosine, basic, direct and pigment colors in the coloring of paper.—A. P.-C.

Water in the Paper Industry. M. Aribert. *Paper Trade J.* 79, No. 19, 52-54 (Nov. 6, 1924). Outline of the water consumption in the manufacture of various pulp and paper, with a discussion of the qualities and of the effects of the various salts dissolved in it.—A. P.-C.

Introduction to the Chemistry of Colloids for Paper Technologists. Rudolf Lorenz. *Paperfabr.* 22, *Frstheft* 43-59 (June 17, 1924). The following topics are discussed: (1) relation of colloid chemistry to industry; ((2) relation of colloid chemistry to the natural sciences; (3) the colloid state; (4) and (5) colloid-chemistry methods and theories in paper manufacture.—J. L. P.

Application of the Theory of Dispersion to the Study of the *Variation in Weight of Papers.* H. Micoud. *Papier* 27, 1263-1273 (Nov. 1924). The author explains the theory of dispersion (practically the same as probability of error), and shows by means of three examples taken from actual manufacturing practice how it can be used to control variations in weight of the paper as it is delivered to the consumer.—A. P.-C.

Capillarity and Swelling in Paper Manufacture. Rudolf Lorenz. *Wochbl. Papierfabr.* 55, 2662-2664 (Oct. 18); 2732-2733 (Oct. 25, 1924). Paper making is not a mechanical process; it is essentially one of capillary chemistry. This thesis is developed from the colloid-chemistry standpoint. Felting is the result of surface forces of the plant fibers. Cylinder drying of paper is a coagulation of the cellulose gel at a high temperature. Groundwood exposed to the sun loses water and an irreversible dehydration occurs. Moist pulp stored for a long time yields an inferior cloudy sheet as compared with fresh pulp—with the former pulp the maximum swelling period has been exceeded to age and syneresis. The work of Schwalbe is reviewed. The investigation of Herzog indicates that cellulose swelling is not an intramolecular but an intermicellular process. The atomic grouping remains unaltered according to X-ray spectrographic analysis. The methods for determining the swelling capacity of organic fiber gels are reviewed.—J. L. P.

Raw Materials

Papermaking Tests with Woods from French West Africa. F. Heim, J. Maheu, M. Cercelet, G. S. Dagand and R. Heim de Balsac. *"Sibo" Wood. Bull Agence Gén. Colonies* 16, 1232 (1923); *Bull. Imp. Inst.* 22, 500-1 (1924). "Sibo" wood (*Sarcocephalus esculentus,* Afzel) from Ivory Coast, contained 8.76% moisture, and, on dry basis, ash 0.20, fats and waxes 0.96 cellulose 67.48, lignin 31.36%. Cooking with caustic soda under pressure gave a yellowish-brown pulp bleaching with difficulty in 33% yield (on dry material) to a pale yellowish color. The pulp is mainly fibrous and contains some cells and fragments of vessels. The fiber length is ½ mm., average 1.4 mm.; diameter 0.015 to 0.035 mm., average 0.025 mm., and felting power 0.018. Paper made from the pulp was of inferior quality, and the pulp could be used only as a filling material. *"Fromager" Wood. Bull. Agence Gén. Colonies* 17, 185 (1924); *Bull. Imp. Inst.* 22, 501. "Fromager" wood (*Eriodendron anfractousum,* D. C.) from Gaboon, containing 9.08% moisture, showed, ferric oxide 0.5%), fats and waxes 0.62, cellulose 68.30, lignin 25.18%. Cooking with caustic soda under pressure gave brownish yellow pulp which bleached easily to a dull white (yield 30%). Ultimate fiber length was 1.0 to 1.8 mm., average 1.4 mm.; diameter 0.020 to 0.030 mm., average 0.025 mm., felting power 0.018. The pulp furnishes paper of an ordinary quality. *"Bahia" Wood. Bull. Agence Gén. Colonies* 17, 377 (1924); *Bull. Imp. Inst.* 22, 501. "Bahia" wood (*Mitragyna macrophylla,* Hiern) from Gaboon, containing 7.54% moisture, showed, on the dry basis: ash 0.77, fats caustic soda under pressure gave a bright brownish-yellow pulp, bleaching with average facility to white with a slight greenish-yellow tint (yield 33%). The ultimate fiber length was 1.2 to 2.7 mm., average 1.7 mm.; diameter 0.015 to 0.035 mm., average 0.025 mm., felting power 0.015. The pulp gave a paper of similar quality to ordinary wood pulp papers.—A. P.-C.

Report of Committee on Wood Measurement. P. J. Murer. *Pulp & Paper* International No., 158-160 (Jan. 1925); *Paper Ind.* 6, 1944-1946 (Feb. 1925); *Paper Mill* 49, No. 6, 198, 200 (Feb. 7, 1925). As long as the moisture content of wood is not reduced below the "fiber saturation point" (carrying from 23.5 to about 28% on wet weight, and 30 to 40% on dry weight), variations in moisture content have practically no effect on the volume of the wood. Preliminary investigations indicate that, while there are large individual variations in wood density, the average of the same species and from the same district is practically a constant.—A. P.-C.

Manufacture of Paper Pulp from Bordeaux Pine (Pinus Maritimus). R. Michel-Jaffard. *Paper Ind.* 6, 681-685 (July 1924); 866-871 (Aug. 1924); *Chemie Et Industrie* Special No., 557-566 (May 1924); *Paper Trade J.* 79, No. 18, 129-132 (Oct. 30, 1924). See *Pulp & Paper* 22, 1140 (Nov. 6, 1924); *Paper Trade J.* 79, No. 14, 48 (Oct. 2, 1924).—A. P.-C.

Micrography of Chestnut Pulp. L. Vidal. *Papier* 27, 1117-1120 (Oct. 1924). The average fiber length is 0.7 to 0.8 mm., ir-

respective of age (up to over 100 years), and average diameter 0.015 mm.; the cell walls are thin and lack strength. The vessels are cylindrical, very transparent, 0.4 to 0.5 mm. long and 0.050 to 0.055 mm. wide, and there is a spiral-shaped filament on the inside, which is hightly characteristic. The ends may be as large as the body of the cell, or tapering to a thread, or broken off completely. There are numerous pits, both plain and bordered. The pulp is considered to be of no practical papermaking value.—A. P.-C.

Manufacture of Pulp from Conifers. L. Ubbelohde. Ger. pat. 403,758. *Papierfabr.* 22, 514 (Oct. 26, 1924). In pine and spruce trees the cellulose fibers vary in length according to the age of the different annular rings. The inventors claim that by the proper cooking process it is possible to separate these rings of fibers, the old from the young.—J. L. P.

Use of Decayed Wood in Bleached Sulphite Pulp. J. D. Rue, R. N. Miller and C. J. Humphrey. *Paper Mill* 49, No. 5, 28, 32 (Jan. 31, 1925). Pulping tests carried out under somewhat more drastic conditions than for the preparation of news grade sulphite showed that some infected wood can be cooked and bleached to a commercial pulp with good yield and strength, but the bleach requirement will be high in rough proportion to the degree of discoloration of the wood. Some grades of infected wood giving a fair yield of usuable news grade sulphite give a much smaller yield of bleached sulphite of doubtful commercial quality. The loss in strength on bleaching is not great in the case of sound wood and of wood infected with *Sterum sanguinolentum* hemlock heart rot) in its early stages, mixed feather rots and *Polystictus abietinus;* but is considerable with wood infected with *Sterem sanguinolentum* (in advanced stages of decay), *Fomes pinicola and Trametes pini.*—A. P.-C.

Pulp from Seaweed. F. C. Thornley, F. F. Tapping and O. Reynard. U. S. pat. 1,509,035, Sept. 16, 1924. Fresh seaweed is macerated and ground to a state of colloidal fineness, and treated with a small proportion of soda ash, milk of lime or other alkali, to convert the alginic acid present into alginate without application of heat. The resultant product is a suspension of cellulosic material and alginate.—A. P.-C.

Fibrous Pulp from Cheap Vegetable Material. M. W. Marsden. U. S. pat. 1,510,855, Oct. 7, 1924. Low-cost vegetable material such as corn stalks, cotton stalks, or straw, is freed from dust and other foreign material, softened with steam, shredded, fermented with yeast, and the fermented mass is distilled to recover alcohol and leave a residue which is suitable for the manufacture of paper.—A. P.-C.

Papermaking Fiber from Straw. C. Weygang. U. S. pat. 1,510,070, Sept. 30, 1924. A papermaking material is obtained from straw by the action of a mixture of 8 parts ot an agueous paste of slaked lime, 1 to 4 parts of petroleum oil, and 4 to 8 parts of soda ash.—A. P.-C.

Caroa Fiber as a Papermaking Material. Merle B. Shaw and Raymond R. Rumsey. *Paper Trade J.* 80, No. 2, 47-49 (Jan. 8, 1925). A laboratory rotary digester is described. Three samples of caroa (*Neoglaziovia variegata*) from Brazil were tested: (a) shredded only, (b) cut and beaten without immersion in water; (c) fermented in water for 10 days after which the gum was extracted. The material was cooked at 342° F. (equivalent pressure 120 lb. per sq. in.) with liquor containing 30g. of alkali (calculated as sodium carbonate) per liter and having a causticity of 98%. The digester was brought up to temperature in 1 hr. kept there 4 hrs., and cooled in 30 min. The percentage of caustic used was varied by taking different volumes of liquor in the various cooks. The preliminary treatment of the plant is the main factor in determining the characteristics of the paper obtained: (a) gives lower yield, bleaching is not practical, but the paper made is very strong; (b) and (c) give good yields of easy bleaching pulp producing a paper which is quite strong, but not as much as paper from (a). Pulp obtained from (b) and (c) with the smaller amounts of caustic are suitable for the production of bag and wrapping papers; while pulp obtained with larger amounts of caustic compares favorably with rag stock. The yields of unbleached pulp obtained were: (a) 39.1 to 43.7%; (b) 45.1 to 55.5%; (c) 55.3 to 67.0%. The fiber length is 2.25 to 5.75 mm., average 4.0 mm.; diameter 0.0046 to 0.0154 mm., average 0.010 mm., indicating excellent felting power.—A. P.-C.

Decomposition of Straw, Reeds, Etc. Paul Krais. Ger. pat. 391,713. *Papierfabr.* 22, 474 (Oct. 26, 1924). The resolution of straw, reeds, etc., is effected with the help of nitric acid without pressure. 1,000 kg. comminuted flax straw is treated with hot water until the total weight is 4,000 kg. Then 3,000 l. of water, 3,000 kg. potassium nitrate, and 100 kg. sulphuric acid are added, and the mixture boiled 3 to 4 hrs.—J. L. P.

Digestion of Straw, Reeds, Etc., by Means of Nitric Acid Without Pressure. Paul Krais. Ger. pat. 395,191; addition to 391,713. *Papierfabr.* 22, 513-514 (Oct. 26, 1924). The raw material is first treated with an acidified boiling potassium nitrate solution (or nitric acid solution) and then is digested at the boiling temperature. The nitrogen oxides are recovered in the process and uses again.—J. L. P.

Production of a Cotton-Like Fiber from Flax Waste. Gottfried Kranzlin. Ger. pat. 406,505. *Papierfabr.* 22, 611 (Dec. 21, 1924). The discovery consists of a chlorination process, using chloride of lime or sodium hypochlorite solutions, for the removal of a cotton-like from flax waste.—J. L. P.

Straw Pulp as a Substitute for Groundwood. Max Bottger. *Papierfabr.* 22, 609 (Dec. 21, 1924). Straw pulp, as produced according to the patented process of the author, is considered to be a good substitute for groundwood. The grinding process gives a high yield f pulp.—J. L. P.

Cladium Mariscus, a New Cellulose Plant. Uhlemann. *Papierfabr.* 22, 477-480 (Oct. 12, 1924). *Cladium mariscus* is a bog plant which grows in abundance in certain localities. The plant, whether green or dried, is easily resolved into cellulose fibers by all the known pulping methods. The yield is about one-quarter of the weight of the dry plant material. Very good papers or paper board may be made from the fibers, either alone or mixed with other fibers. The structure of the fibers is very fine, and the digestion and bleaching processes must be carried out with care to obtain good yields. Photomicrographs of the fibers are shown. The DeVains chlorination process applied to *Cladium mariscus* yielded a superior white pulp.—J. L. P.

Tambookie Grass for Papermaking. E. F. English. *S. Afr. J. Ind.* 7, 745-752 (1924). Tambookie grass (*Hyperrhenice glauca,* Stent.), freed from the flowering tops, and showing by analysis 58.7% of cellulose, was cooked experimentally under varying conditions by the soda process in apparatus of a somewhat improvised nature. Digestion for 5 hrs. with 20% of caustic soda on the weight of dry grass at 70 lb. pressure gave a yield of 46 to 47% of dry pulp (on the dry grass). The pulp was light in color, required 6 to 7% of bleaching powder, and showed an average fiber length of 1.5 mm. The beaten pulp felted well and gave a strong sheet of paper. Tambookie grass pulp should be suitable for making good grades of white paper, and could be advantageously used in admixture with short-fibered pulps from South African woods.—A. P.-C.

Paper and Cardboard from Grass, Straw, Etc. *Ges. für Mechanische Zellulose.* Eng. pat. 216,532 and 216,533. In the manufacture of paper or cardboard from grasses, straws or stems of cereals, legumes, potatoes or similar plants, the materials are cut into chaff, moistened and steamed in a boiler for two to four hours under five to six atmospheres' pressure. The material may thus run through a pulping apparatus such as a rag engine and the natural glutinous material which is present renders the addition of size and fillers unnecessary in the making up of the final product. *No.* 216,533 specifies a similar process of preparing halfstuff for cellulose manufacture.—A. P.-C.

Section of the

COST ASSOCIATION OF THE PAPER INDUSTRY

Affiliated with

THE AMERICAN PAPER AND PULP ASSOCIATION

Conducted by THOS. J. BURKE, C.A., Sec-Treas

Joint Pulp Report of the Associations

The report compiled by a joint committee appointed by the Cost Association of the Paper Industry, the Technical Association of the Pulp and Paper Industry and the American Pulp and Paper Mill Superintendents' Association to investigate the manufacture of unbleached sulphite, bleached sulphite, soda sulphate and ground wood pulps has now been published. The committee consisted of the following:

Chairman—B. T. McBain; Cost Members—J. E. Hyde, W. F. Bromley, E. J. Fitzgerald, C. A. Jasperson, T.A.P.P.I. Members—V. E. Fishburn, A. D. Woods, G. K. Spence, S. C. Brayton, R. M. Radsch; Superintendents Members—B. T. Larrabee, J. A. Bowers, James G. Ramsay.

The Committee sent out questionnaires to a number of representative mills who are thanked by the Committee for their splendid cooperation. Replies received have been tabulated by the Committee. Following is the report:

Unbleached Sulphite Pulp

Wood Room

How much wood do you put into a single pile in the wood yard?

The amount varied from 4,000 to 120,000 cords, but 4 out of 7 mills agreed on 10,000 cords. The ideal number of cords to put into one pile at any mill depends upon local conditions, such as 10,000 cords maximum to a pile might be in a general way ideal.

What do you consider to be the practical and ideal method of preparing rought wood?

There were various answers to this question, such as put in pile, keep rough and peeled separate, 500 cords on concrete sleepers and end on end, short way of pile. The Committee hesitates to attempt to establish a standard as to method of piling but agrees that rough and peeled wood should be piled separately, especially rough fir, which deteriorates very much more rapidly than peeled spruce with age.

What do you use for dunnage?

Concrete piers, coal ashes, peeled logs, cinder fill (2) and pulp wood skids. The Committee recommends cinder fill with good drainage.

What percentage of wood is peeled?

This varied from 15 per cent to 100 per cent.

How do you prepare your wood, by drum or disc barking?

Two mills used disc barkers, three used both, three used drum barkers.

What is the total loss of bark and wood?

The answers varied from 12½ to 18 per cent, using drum barkers, and 15 to 25 per cent with disc barkers. The Committee believes that 15 per cent maximum for drum barkers and 25 per cent maximum for disc barkers ought not to be exceeded.

What do you consider to be the practical and ideal method of preparing rough wood?

The mills were practically unanimous that the ideal method is to sap-peel the wood, thereby minimizing the waste from this source. The Committee feels safe in standardizing on this method and recommends that each mill make a special effort to do this in order to help conserve our forests.

Do you wash all your wood before chipping?

All mills answered "Yes."

If not, do you think it should be done?

The Committee agreed it should be done.

What size chipper do you use, how many knives, and what speed do you run?

Seven mills used 88"—4 knives at a speed varying from 185 to 300 R.P.M.; one mill, 108"—3 knives at 180 R.P.M.; one 90"—3 knives at 288 R.P.M.; and one, 74"—3 knives at 230 R.P.M.

How many knives, what speed and size would you consider ideal?

An 88 inch disc with 4 knives and a speed of about 220 to 250 R.P.M. would be ideal. The wood should be fed to the chipper with the weight of at least two sticks of 4 feet wood, bearing against the stick being chipped. This would necessitate a 12 foot spout, but would do away almost wholly with jumping of the stick being chipped, and would produce a more uniform chip and less shives and saw dust.

What is the length of the wood fed to the chipper?

It varies from 18 to 48 inches.

What type chip screen do you use?

Seven mills use the flat shaker and two use the shaker for oversize and rotary for sawdust. The ideal screen apparently is the flat shaker.

What is the size of the perforations in chip screen?

The size varied in different mills from 1 x 1½ inches to 2¼ x 1⅛ inches, although 7 of 10 were approximately 2 x 1 inch. The ideal size would be about 1¾ x ⅞ inches.

What is the size of the perforations in the saw dust screen?

The sizes reported varied from ⅛ to ¼ inch. The ideal size is apparently about 5 mesh.

What size and type crusher do you use?

Various types were used, the size depending upon the production.

Do you crush all the chips or just the rejects from the chip screen?

Nine mills answered "Rejects" while one crushed them all. It would seem that the ideal procedure would be to crush rejects only, specially from the standpoint of sawdust loss.

Do you weigh the chips going into chip pen?

All mills answered "No." The committee agrees that it should be done.

(a) Size of chips.

The size reported varied from 5/8 to 1 inch, although 6 mills answered 5/8 inch chip is no doubt the ideal size.

(b) Screen Test.

1. Percent correct size.
2. Percent undersize.
3. Percent sawdust.

The percent correct size from various mills varied from 77 to 85 per cent; undersize, 14 to 20 per cent, and sawdust from 1 to 7 per cent.

With ideal conditions a maximum of 3 per cent should not be exceeded in sawdust produced.

Acid Plant

Do you use the milk of lime system with a high magnesium base or a limestone system?

Four mills were using the milk of lime system, five the limestone system, and one was using both.

Which system do you consider ideal in making your grade of pulp?

Four mills answered the milk of lime system, four the tower system and two uncertain.

Do you use dry or melted sulphur?

Six mills used melted and five dry sulphur. Melted sulphur is ideal.

How do you control the flow of sulphur fed to the burner?

Five mills fed the burner by hand and three automatically. Automatic feed is ideal and practical.

What R.P.M. do you operate the burner?

This varied from 1 revolution in 5½ min. to 1 R.P.M. The ideal speed would be about ½ R.P.M.

Do you use a Mono or some other type SO_2 recorder?

Four mills reported using a Mono.

If so, do you consider it practical?

One mill reports "No," another mill says "when it works," and two mills say "Yes, if taken care of." The Committee agrees that a recording Pyrometer is ideal and practical and is a positive indicator of burner conditions.

Do you make any attempt to wash or scrub out the SO_2 gas from the burner gas?

All mills, with one exception, answered "No." It should be done.

What type cooler do you prefer for the burner gases, horizontal lead pipes, immersed in water, or vertical pipes, showered at the top thereby covered with a film of water?

Five mills are using the vertical type, two the horizontal and two the combination of both types.

The ideal cooler probably is the vertical type.

If you are operating the milk of lime system, what type, size and speed of vacuum pumps would you like to use?

This would vary according to tonnage.

How many inches vacuum do you average?

Vary according to tonnage.

Outline briefly the procedure in preparing the milk of lime for system?

Common practice.

If you operate the limestone system, what type, size and speed of pulp do you consider the best to use to take care of the burner gas?

One mill answers "15 inch lead case with aluminum propeller"; one says, "Variable speed motor"; one, "30 inch lead fan 900 R.P.M."; and another says "Specially designed fan."

What kind of storage or reclaimer tanks do you use?

All mills answered, "Hard pine."

What kind do you consider ideal?

Four mills answer "Tile lined concrete"; two say "Hard pine"; and one prefers steel tanks lined with lead and brick.

The Committee believes hard pine makes the ideal tank.

What is your method of mixing the relief from the digester with the cold in storage tanks?

Usual procedure.

Cost Section

TYPICAL ANALYSIS

A. Sulphur.

1. Per cent moisture	0.24
2. Per cent ash	0.63
3. Per cent sulphur	99.13
	100.00%

B. Lime.

1. Loss on ignition	0.04
2. Insoluble matter	0.68
3. Iron and aluminum oxides	0.12
4. Calcium oxide	55.76
5. Magnesia oxide	43.40
	100.00%

C. Limestone.

1. Color.
2. Appearance.
   a. Coarse.
   b. Fine.
3. Loss on ignition.
4. Insoluble matter 0.22
5. Iron and aluminum oxide 0.38
6. Magnesium oxide 0.61
7. Calcium oxide 99.10
8. Carbon dioxide.

Gas.

1. Strength of gas leaving coolers.
   15 to 16% would be ideal.
2. Temperature of gas leaving burners.
   Reports from the various mills ranged from 580° to 800° C. would seem to be ideal.

Water.

A. Temperature.
   The temperature will vary according to the season of the year and locality. The committee recommends artesian well water for ideal operation.

Acid.

A. Test acid plant.
   Test will vary according to local conditions. A complete record should be made at least hourly of all detail as strength of acid, Be. test, temperatures, etc.

Digester Room

Do you pump the acid into the bottom or top of the digester?

Nine mills pump in at the bottom and two at the top. The ideal procedure is to pump the acid into the bottom.

Outline briefly the exact procedure of filling the digesters?

Usual practice.

What size digester do you operate and how long does it take to fill ready to steam?

Wide variation in sizes reported and time required to fill varied from 35 min. to 1¼ hrs.

What shape digester do you operate?

Various shapes reported.

What size and shape would you consider ideal?

12 ton digesters, conical top and bottom, diameter ⅓ of length would seem ideal.

Does the steam enter the digester directly at the bottom through one pipe, or is it otherwise distributed into the digester?

Practically all mills use one entrance of steam to the digester, using a bottom and end steam valve.

What do you consider ideal?

One entrance at bottom of digester with one bottom and one end steam line leading into same is apparently ideal.

Do you use a separator in cooking?

Nine mills do not and two do.

Under what conditions would you care to use one?

Wet wood, low total cooking acid, to make easy bleach if sulphur consumption were not important. Wet wood and hemlock were the answers.

Do you use a side relief in cooking?

Seven mills reported using a side relief and four "No."

Under what conditions would you care to use one?

The answers were "Wet wood and fast cooking." The majority favor a side relief and it would seem that this procedure may be ideal.

Do you shut in the digester coming to pressure?

All mills answered "No."

Steam saving claimed, more even penetration and reduced screenings? The Committee recommends an investigation of this point to determine its value, if any.

Do you shut in the digester after reaching pressure?

Eight mills answered "No," one shuts in at 120° C., one a short time and one answers, "Not usually."

Why? What is the effect?

Saving steam and better penetration, low temperature and better penetration, more complete saturation—were the benefits reported.

Do you use a regulator for each digester?

All Mills reported "Yes." A regulator for each digester is ideal.

What type strainer do you consider ideal?

Hard lead, bowl shaped, with 3/16 inch perforations lead with bronze flanges; twin inverted bronze cups 6 inches in diameter with 170¼ inch holes; perforated lead; bronze; and a hemisphere of lead; 15 per cent antimony with 3/16 inch holes—were the types reported.

The Committee agreed that hard lead, bowl shaped, with 3/16 inch perforations would be an ideal strainer.

What type of relief cooler do you like best?

The mills reported as follows: Wolf, Beehive or Pelley—Straight lead on hot end and Pelley coolers on cold end—Cast bronze—Wolf—Beehive—Horiztontal lead pipe—Beehive—Beehive.

Would you prefer to have a separate cooler for each digester or relieve all in one cooler?

Mills practically unanimous in favor of separate coolers. A separate cooler for each digester would probably be the ideal condition under which to operate.

What strength and combination acid do you consider ideal?

The answers varied from 4.40—2.90—1.50 to 6.00—4.88—1.12.

The average of eight mills was 5.10—3.94—1.16 which we believe to be pretty nearly an ideal strength and combination.

In your opinion what would be the average length of life of a good digester lining?

The answers ranged from 4 to 10 years. The average of eleven mills was 6½ years.

The Committee believes a good lining with proper care and maintenance should last 6 to 7 years.

With standard conditions under which to operate, how much of a variation in the time of cooking would you consider good operation?

The answers varied from 0 to 45 minutes. With standard conditions the time ought not to vary over 30 minutes.

COOKING:

1. Actual cooking time.

This varied in different mills from 6½ to 11 hours. The time of course is governed by local conditions.

2. Gauge, steam, gas pressure and temperature.

The actual cooking schedule must necessarily vary according to local conditions.

3. Hour which relief is started.

The answers from various mills showed a range from 1 hr. 5 min. to 3 hours, but this feature is governed wholly by local conditions.

4. Steam.
   A. Pressure main steam line.
   B. Degrees superheat.
   C. Number 1,000 lbs. per ton pulp.

The amount of steam as reported varied from 5,500 pounds to 7,000 pounds per ton pulp.

5. Blow off test.
   A. Test of gas.
      (1) Hot.
      (2) Cold.
   B. Color of liquor.
   C. Other tests.

There were no reports in connection with these questions. The Committee believes that ideal conditions in cooking would be as follows:

1. Uniform steam pressure.
2. Steam regulator for each digester.
3. Steam flow meter in connection with each digester.
4. Recording temperature gauge.
5. Recording pressure gauge.
6. Standard penciled curve to follow coming to pressure.
7. Standard penciled temperature curve.
8. The blowing point should be indicated by both the iodine test and a standard color. One is equally as valuable as the other and they should be used in conjunction with each other.
9. Use a cooking report showing all detail in connection with each digester cooked.
10. A maximum temperature of 146° C. or 295° Fahr. should not be exceeded.

BLOW PITS

In a general way what is your procedure in blowing and washing pulp?

The Committee recommends that a certain amount of water be run into the pit so that when the pulp is blown into the pit it will spread more evenly over the surface of the pit. In washing, the pulp should be absolutely covered with water all the time until the pulp is thoroughly washed. Clear, colorless water is an indication of well washed pulp.

Do you use wood or tile bottoms?

What size perforations?

Six mills used wooden bottoms with ⅛ inch holes, and two used tile with 1/16 inch holes.

What kind of a bottom and what size perforations do you consider ideal?

Three mills say "Wood with ¼ to ½ inch perforations, covered with cocoa matting"; two, wood with 1.8 inch holes; and two, "tile with 1/16 inch holes."

From the standpoint of loss of fibers the committee agrees that a wood bottom with ½ inch perforations covered with cocoa matting would be ideal if it is practical.

SCREEN ROOM

Do you use knotters?

All mills answered "Yes."

If so, what size and speed?

Sizes reported were 20 to 30 tons with perforations ranging from 5/32 to ⅜ inch and speed of 7 to 26 R.P.M. This is a local problem for each mill to solve.

The perforation should be of a minimum size, sufficient to handle maximum production and run at a minimum speed, necessary to do the work.

Do you operate centrifugal screens or flat screens?

All book, wrapping and bond mills use flat screens and the news mills, centrifugal or combination of both. This report bears out what the Committee believes to be ideal.

What is the size, R.P.M. and perforations of your centrifugal screens?

Three mills reported .055 perforations and a speed of from 350 to 385 R.P.M. Screens running 380 R.P.M. with .055 perforations are apparently ideal.

How many plates and what cut plates do you use on your diaphragm screens?

The answers were as follows: 12 plates; 16 plates—.007—.008—.009; 12 plates—.007—.009; 12 plates—.008 to .014; 10 cut; .007—.008—.009; 12 plates .010; .007—.008—.009.

COST SECTION

The Committee agreed that .007—.008—.009 cut plates were ideal.

If you use different cut plates, where are they located in the screen?

All answered "Coarse first; fine last." This is ideal.

What speed do you run the flat screens?

The answers were as follows: 170, 156, 160, 170, 128, 145, 130, 145, 170. The average speed is 151. The ideal speed is apparently from 145 to 155.

What is the pitch of your screens?

The answers were as follows: ¼ inch to foot, ¼ inch to foot, 1/6 inch to foot, 3/16 inch to foot, 3/16 inch to foot, 1/12 inch to foot, 3/16 inch to foot.

The Committee believes that ¼ to 3/16 inch pitch per foot, preferably 3/16 inch would be ideal.

What kind of a water spray do you use on the screens?

The answers were as follows: Flattened type, spray, flattened pipe, 2 inch pipe with flattened nozzle, fish tail spray and shower pipes.

We have agreed that the fish tail or fan spray directed straight down on the screens is ideal.

How often do you average changing plates?

The answers varied from once a week to one new set a year. From information obtainable it would seem that 5 to 7 months would be about the average time.

Do you use shallow or deep rifflers?

Four mills reported shallow, two deep and two none.

If either, what is the depth of the stock as it flows over the riffler the rate of speed it flows, the density and the material used in the bottom?

The answers were as follows: 3 inch deep, 50 feet per min. ⅓ per cent density; 7 inches deep, 35 per cent density with felt bottom; 4 to 6 inches deep, 50 feet per min., 5 per cent density with cotton felt bottom; and 4 inches deep and 5 per cent density.

The ideal conditions apparently are 3 to 5 inches deep, 50 feet, per min. flow, about ⅓ per cent density and a felt bottom.

What style deckers do you use? What is the speed run and the mesh of the wire used?

The answers were as follows: 40 mesh, 18 R.P.M.; 70 mesh, 25 R.P.M.; 60 mesh, 11 R.P.M.; 60 mesh, 30 R.P.M.; 65 mesh; 60 mesh, 8 R.P.M; 60 mesh, 17 R.P.M.; 60 mesh, 10 R.P.M.

According to these records it is indicated that deckers of 60 mesh run at about 20 R.P.M. would be operating under ideal conditions.

Describe briefly the system of screening you believe to be ideal.

The committee agreed as follows:

For high grade unbleached sulphite: knotters, coarse flat screens, plates about .018 to .020 cut, then five flat screens with plates .007—.008—.009 cut and shallow rifflers.

For high grade bleached sulphite: knotters, coarse flat screen, plates about .018 to .020 cut, centrifugal screens and shallow rifflers. Bleach and then re-screen through fine flat screens.

For news print: knotters, then centrifugal screens.

Consistency of Stock.

A. At knotters,
B. At screens,
C. At deckers.

The only complete answer returned for this question was .383 per cent at knotters, .333 per cent at screens and .267 per cent at deckers.

WHITE WATER

What percentage of white water do you use? Where do you use it?

Answers were as follows: Use 75 per cent at blow pits, head box, showers and screens. All of it at screens, head box and pits. 60 per cent at screens, showers and shower hose. 60 per cent at screens, and showers. 60 per cent at knotters, screens and blow pits.

Practically all white water should be used.

COST SECTION

Do you refine your knots and screenings? If so, how do you accomplish this?

SCREENING

Answers were as follows: Kollergang; Jordan; Jordan; Jordan and Howard refiner; Clafflin-Jordan; Howard refiner and Jordan; Howard; Jordan.

Does it pay to refine the screenings?

All answered "Yes."

Per cent screenings.

Reports from eleven mills varied from 2 per cent to 10½ per cent. The average was 4.3 per cent.

FINISHED PULP

Ball Mill Test.
A. Strength.
Elmendorf Test.
A. Tear.
Dirt.

It is understood by this Committee that the Committee on Sulphite from the Technical Association either have completed or will complete, at some future time, standards for the above, and as this is the logical Committee to do this work, we have not attempted to accomplish anything along these lines. No doubt these tests will be standardized and the results published sometime in the near future.

COST+

With reference to establishing standards for Costs, the questionnaires all indicate that cost data is considered essential by the mills answering and there is a general agreement that wood shall be charged at the average cost price, that the steam used should be metered, and that a detailed cost report for the operation of the Sulphite Mill should be made up at least monthly. The mills, however, are not in agreement on the principle of charging their sulphite to the paper mill at cost, and this is of course a question of mill policy as to whether the paper mill is to be charged at the cost of market price. A standard cost sheet will be drawn up by the members of the committee from the Cost Association.

(*To be continued*)

Phoenix Air Filter Catalogue

Drying Systems Inc. of Chicago has issued a new catalogue describing their Phoenix air filter. The catalogue is supplemented by much useful information under such titles as "Filtered Air," "Air, The Conveyor," "Contaminated Air," "Dustless Air," "The Viscous Film," "The Air Washer," "The Fabric Filter," "The Dust Collector," "Varying-Effect Filters," etc., etc.

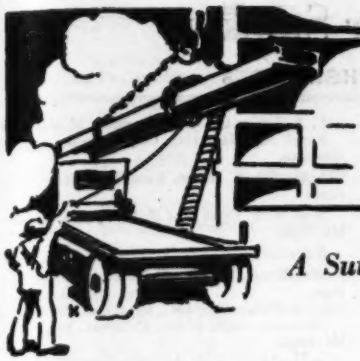
The construction of the Phoenix air filter is described as well as the sizes and types. Cuts illustrate the catalogue. Regarding the application of the Phoenix filter, the catalogue says:

"The Phoenix filter may be successfully applied for any service wherein clean air is required. Drying Systems, Inc., manufacturers of the Phoenix filter, have, for many years, designed and installed, various types of air handling equipment in all parts of the United States and in many parts of Europe.

"The engineering experience so acquired is at the disposal of purchasers of Phoenix filters, assuring proper design, workmanship, and installation, both from the standpoint of economy and that of adequacy to the given requirement."

Henry S. Mead Heads Wrenn Paper Co.

MIDDLETOWN, Ohio, July 20, 1925.—At a meeting of the directors of the Wrenn Paper Company held on July 14, Henry S. Mead was elected president and treasurer of the company, to succeed John Gibson, Jr., who died on July 8. The other officers will remain as before, E. T. Gardner, vice-president, and J. J. Hallowell, secretary. The directors are W. V. Darling, E. T. Gardner, J. J. Hallowell, M. S. Johnston and Henry S. Mead. The business will continue to be operated on the same lines as formerly.



CONSTRUCTION NEWS

A Summary of Vital Facts Regarding Construction, Finances and Operation of Paper Mills

Construction News

Lansdale, Pa.—The Crown Paper Company, care of J. S. Fuller, 5438 Locust street, Philadelphia, Pa., architect, has preliminary plans under way for the construction of a new local plant, consisting of two one-story units, 75 x 150 feet, and 30 x 120 feet, respectively, on Kenilworth street, reported to cost in excess of $50,000, with equipment. It is expected to begin work at an early date.

Kalama, Wash.—The Lewis River Pulp and Paper Company has closed negotiations for a tract of land at South Kalama, and is reported to be planning to use a portion of the site for plant extensions. A. D. Bowen is president.

St. Louis, Mo.—The F. J. Schleicher Paper Box Company, Eighteenth and Chouteau streets, has acquired property on Bingham avenue, 265 x 650 feet, as a site for a new plant. It is reported that plans are in progress for a multi-story building, estimated to cost in excess of $175,000, including equipment.

St. Paul, Minn.—The proposed paper box manufacturing plant to be constructed by the Brown & Biglow Company, University avenue, will cost close to $200,000, with machinery, instead of a smaller amount, recently reported. It will be three-story and basement, brick steel and terra cotta. Colburn & Forsell, 210 South Ninth street, Minneapolis, Minn., are architects.

St. Paul, Minn.—The Waldorf Paper Products Company, Myrtle and Pillsbury avenues, has filed plans for the construction of its proposed one-story power house at Hampden and University avenues, 56 x 100 feet, to cost approximately $90,000, with equipment. A general contract has recently been let to the Paul Steenberg Construction Company, Builders' Exchange building. H. A. Sullwold, 107 East Third street, is architect.

Monroe, Mich.—The Consolidated Paper Company has work in progress on a new mill to be used primarily for the production of strawboard products, reported to cost in excess of $75,000. The installation will include beaters, digesters, forming machines, electric power equipment and accessory apparatus.

Salem, Ore.—The Western Paper Converting Company, recently organized by E. A. O'Neill of the Oregon Pulp and Paper Company, Salem, and associates, is arranging to take out a state charter. The company has preliminary plans under advisement for the construction of a new plant either on local site or one to be selected at Vancouver, Wash., for the manufacture of a line of paper by-products, estimated to cost close to $200,000, with equipment.

Skowhegan, Me.—The Savage Paper Company is said to have tentative plans under advisement for the rebuilding of the portion of its local mill, destroyed by fire July 13, with loss estimated at close to $150,000, including building, equipment and stock.

Akron, N. Y.—The Pasterboard Company, Bloomingdale avenue, manufacturer of composition wallboard products, is arranging plans for the early rebuilding of its local plant unit, recently partially destroyed by fire, with loss reported at close to $20,000.

Poughkeepsie, N. Y.—The Trussell Manufacturing Company, Poughkeepsie, manufacturer of loose leaf paper specialties, has acquired the former local plant of the duPont Viscoloid Company, now removing its works to Leominster, Mass. The new owner will take possession of the factory in the near future, and is said to have plans for the removal of its present business to the new location, with the installation of additional production facilities.

Camas, Wash.—The Crown Williamette Paper Company, 248 Battery street, San Francisco, Cal., has awarded a general building contract to A. Guthrie & Company, Sherlock Building, Portland, Ore., for the construction of a two-story addition at its local mills, to be 40 x 87 feet. It is understood that the structure will be equipped for the manufacture of paper bags and containers.

Carlisle, Pa.—Fire, July 14, destroyed the local plant of the Carlisle Paper Box Company, with loss estimated at close to $75,000, including equipment. Pending decision for rebuilding, the company plans to lease a nearby factory for the continuance of production, and will install equipment at an early date. W. I. Tay heads the organization.

Edmundston, N. B.—The Fraser Companies, Ltd., Edmundston, is reported to have selected property in New Brunswick, for the construction of a large mill for the production of newsprint. As now projected the plant will consist of a number of units, with estimated cost placed in excess of $1,000,000. The company has work under way on a new mill at Madawaska, Me., and proposes to have the initial units ready for equipment installation in the near future.

Sarnia, Ont.—Fire, July 12, damaged a portion of the plant of the Premier Paper Products Company. An official estimate of loss has not been announced. The damage will be replaced.

Financial

New York, N. Y.—The Savoy Card and Paper Company, 409 Pearl street, has filed notice of dissolution under state laws.

Detroit, Mich.—The Spaulding Fibre Company, Inc., North Rochester, N. H., has filed notice of organization to operate in Michigan, with a capital of $2,496,000. Clyde M. Metelski, 1010 Beaubien street, Detroit, is local representative.

Baltimore, Md.—Meyer Reamer and Jacob M. Moses have been appointed receivers for the American Wall Paper Company, 347-49 North Gay street.

Buffalo, N. Y.—The Bison Waste Paper Company, 176 Terrace street, has filed notice of dissolution under state laws.

Philadelphia, Pa.—An involuntary petition in bankruptcy has been filed against the Osburn Paper Company, Bourse building, by a number of creditors, including the Dells Paper & Pulp Company and the Nashua River Paper Company.

Imports of Paper and Paper Stock

NEW YORK, BOSTON, PHILADELPHIA AND OTHER PORTS

NEW YORK IMPORTS

WEEK ENDING JULY 18, 1925

SUMMARY

News print .....97 bls.
Wrapping paper .....695 bls., 25 cs.
Printing paper .....193 cs., 178 rolls, 74 bls.
Wall paper .....44 bls., 8 cs.
Cigarette paper .....3,361 cs.
Surface coated paper.....15 cs.
Colored paper .....1 cs.
Writing paper .....1 cs.
Drawing paper .....9 cs.
Fancy paper .....4 cs.
Cover paper .....16 cs.
Paper hangings .....7 bls., 1 cs., 3 cr.
Parchment paper .....3 cs.
Gold-coated paper .....4 cs.
Silk paper .....4 cs.
Hanging stock .....353 bls.
Metal paper .....2 cs.
Baryta coated paper .....25 cs.
Tissue paper .....7 cs.
Transfer paper .....1 cs.
Tinfoil paper .....23 cs.
Litho. paper .....42 cs.
Miscellaneous .....101 cs., 59 bls., 37 pgs.

CIGARETTE PAPER

P. J. Schweitzer, Rochambeau, Havre, 26 cs.
Standard Products Corp., by same, 23 cs.
Standard Products Corp., Pipestone County, Havre, 20 cs.
Liggett & Myers Tobacco Co., by same, 17 cs.
American Tobacco Co., Collamer, Bordeaux, 1,150 cs.
P. J. Reynolds Tobacco Co., Collamer, St. Nazaire, 1,880 cs.
De Manduit Paper Corp., by same, 158 cs.
Standard Products Corp., Paris, Havre, 23 cs.
F. P. Gaskell, by same, 28 cs.
P. J. Schweitzer, Pres. Hayes, Marseilles, 28 cs.
S. Alexandre, Caracoli, Bordeaux, 3 cs.
Max Spiegel & Son, by same, 5 cs.

PAPERHANGINGS

W. H. S. Lloyd & Co., Laconia, Liverpool, 1 ble.
W. H. S. Lloyd & Co., by same, 1 cs.
W. H. S. Lloyd & Co., Carmania, Liverpool, 6 bls.
W. H. S. Lloyd & Co., by same, 3 crates.

WALL PAPER

F. J. Emmerich & Co., A. Ballin, Hamburg, 6 bls.
Globe Shipping Co., by same, 26 bls.
F. J. Emmerich & Co., Carmania, Liverpool, 9 bls.
A. C. Dodman, Jr., Inc., Belgenland, Antwerp, 3 bls.
Bendix Paper Co., Volendam, Rotterdam, 8 cs.

HANGING STOCK

F. & R. Trading Corp., Belgenland, Antwerp, 353 bls.

FANCY PAPER

Whiting & Patterson Co., Homeric, London, 4 cs.

NEWS PRINT

J. P. Heffernan Paper Co., M. Washington, Trieste, 97 bls.

PRINTING PAPER

Japan Paper Co., C. Rosso, Genoa, 2 cs.
W. Hartman & Co., A. Ballin, Hamburg, 74 bls.
Irving Bank Columbia Trust Co., by same, 178 rolls.
Martin & Bechtold, Stuttgart, Bremen, 9 cs.
B. F. Drakenfeld & Co., Carmania, Liverpool, 27 cs.
Oxford University Press, by same, 10 cs.
P. C. Zuhlke, Belgenland, Antwerp, 145 cs.

WRAPPING PAPER

W. Schall & Co., A. Ballin, Hamburg, 131 bls.
F. C. Strype, by same, 564 bls.
E. Dietzgen & Co., by same, 25 cs.

COVER PAPER

International Forwarding Co., A. Ballin, Hamburg, 16 cs.

METAL PAPER

Hensel, Bruckman & Lorbacher, A. Ballin, Hamburg, 2 cs.

GOLD COATED PAPER

G. B. Richard & Co., Stuttgart, Bremen, 4 cs.

BARYTA COATED PAPER

Globe Shipping Co., America, Bremen, 25 cs.

SURFACE COATED PAPER

Gevaert Co. of America, Belgenland, Antwerp, 15 cs.

COLORED PAPER

C. W. Williams & Co., Belgenland, Antwerp, 1 cs.

SILK PAPER

S. Gilbert, Volendam, Rotterdam, 4 cs.

PARCHMENT PAPER

S. Gilbert, Volendam, Rotterdam, 3 cs.

TISSUE PAPER

Meadows, Wye & Co., Laconia, Liverpool, 2 cs.
F. C. Strype, Carmania, Liverpool, 5 cs.

WRITING PAPER

C. Clark & Co., Paris, Havre, 1 cs.

TRANSFER PAPER

Fuchs & Lang Manfg. Co., America, Bremen, 1 cs.

DRAWING PAPER

G. W. Sheldon & Co., Port Macquarie, London, 9 cs.

TINFOIL PAPER

Enoch Morgans Sons Co., Laconia, Liverpool, 23 cs.

LITHO PAPER

Fuchs & Lang Manfg. Co., Pr. Hayes, Canton, 42 cs.

MISCELALNEOUS PAPER

Standard Products Corp., Rochambeau, Havre, 37 pgs.
C. H. Boulin, by same, 40 cs.
W. H. S. Lloyd & Co., by same, 1 cs.
International Forwarding Co., A. Ballin, Hamburg, 21 cs.
J. P. Heffernan Paper Co., by same, 25 bls.
Perkins, Goodwin & Co., M. Washington, Trieste, 29 bls.
Coenca, Morrisson & Co., Paris, Havre, 2 cs.
F. J. Emmerich & Co., by same, 5 bls.
Guibout freres, by same, 3 cs.
P. C. Zuhlke, Volendam, Rotterdam, 6 cs.
P. H. Petry & Co., by same, 12 cs.
Globe Shipping Co., by same, 11 cs.

RAGS, BAGGINGS, ETC.

V. Galaup, Rochambeau, Havre, 51 bls. rags.
Equitable Trust Co., by same, 143 bls. rags.
Irving Bank Columbia Trust Co., by same, 161 bls. rags.
Maurice O'Meara Co., Pipestone County, Dunkirk, 16 bls. cottonwaste.
The Stone Bros. Co., Inc., Pipestone County, Havre, 145 bls. bagging.
A. W. Fenton, Inc., by same, 160 bls. rags.
V. Galaup, by same, 26 bls. rags.
Darmstadt, Scott & Co., by same, 41 bls. rags.
Atterbury Bros., Inc., by same, 549 bls. rags.
A. W. Fenton, Inc., A. Ballin, Hamburg, 93 bls. dark cottons.
A. W. Fenton, Inc., by same, 252 bls. rags.
W. Schall & Co., by same, 119 bls. rags.
Chemical National Bank, by same, 63 bls. bagging.
National Bank of Commerce, by same, 100 bls. bagging.
E. J. Keller Co., Inc., by same, 2 bls. rag pulp.
E. J. Keller Co., Inc., by same, 1,347 bls. rags.
State Bank, by same, 53 bls. rags.
Second National Bank, by same, 72 bls. bagging.
Seaboard National Bank, by same, 37 bls. rags.
Brown Bros. & Co., by same, 188 bls. rags.
Whaling Waste Products Co., by same, 53 bls. cordwaste.
G. Levi & Co., Kofuku Maru, Leghorn, 99 bls. rags.
E. J. Keller Co., Inc., Nervier, Antwerp, 317 bls. rags.
E. J. Keller Co., Inc., by same, 55 bls. bagging.
Royal Manufacturing Co., by same, 39 bls. cottonwaste.
Ayres W. C. Jones, Laconia, Liverpool, 19 bls. rags.
New York Trust Co., P. Macquarie, London, 113 bls. rags.
National City Bank, by same, 316 bls. rags.
W. Barnet & Son, Collamer, Bordeaux, 4 bls. rags.
E. J. Keller Co., Inc., by same, 129 bls. rags.
Goldman, Sachs & Co., Collamer, St. Nazaire, 79 bls. rags.
L. H. Abenheimer, America, Bremen, 57 bls. rags.
Salomon Bros. & Co., Pr. Arthur, Alexandria, 139 bls. rags.
E. J. Keller Co., Inc., by same, 156 bls. rags.
Equitable Trust Co., by same, 200 bls. rags.
Castle & Overton, Inc., by same, 27 bls. rags.
Baring Bros. & Co., by same, 90 bls. rags.
A. W. Fenton, Inc., Cape Town Maru, Hamburg, 212 bls. rags.
S. Birkenstein & Sons, by same, 77 bls. rags.
S. Birkenstein & Sons, by same, 207 bls. linseys.
C. R. Spence, Wells City, Bristol, 357 bls. rags.
National City Bank, Caracoli, Havre, 66 bls. rags.
E. J. Keller Co., Inc., by same, 29 bls. rags.
E. J. Keller Co., Inc., by same, 19 bls. bagging.
Royal Manufacturing Co., by same, 20 bls. cottonwaste.
Ayres W. C. Jones, by same, 46 bls. cottonwaste.
National City Bank, by same, 20 bls. cottonwaste.
New York Trust Co., Caracoli, Bordeaux, 46 bls. rags.
Anglo South Amwerican Trust Co., by same, 37 bls. rags.
A. E. Fenton, Inc., Incemore, Leith, 111 bls. rags.
National City Bank, by same, 48 bls. rags.
E. J. Keller Co., Inc., Incemore, Dundee, 115 bls. bagging.
W. Schall & Co., by same, 48 bls. bagging.
A. W. Fenton, Inc., Incemore, Belfast, 56 bls. rags.
M. Snedeker Corp., by same, 73 bls. rags.
W. Barnet & Son, Carmania, Liverpool, 62 bls. rags.
Castle & Overton, Inc., Cabo Torres, Leghorn, 127 bls. bagging.
P. Berlowitz, Cabo Torres, Marseilles, 248 bls. rags.
G. W. Millar & Co., by same, 89 bls. rags.
Salomon Bros. & Co., by same, 44 bls. rags.
N. Y. Trust Co., Cabo Torres, Barcelona, 94 bls. dark cottons.
N. Y. Trust Co., by same, 118 bls. rags.
Equitable Trust Co., by same, 187 bls. rags.
Darmstadt, Scott & Co., by same, 55 bls. burlaps.
Brown Bros. & Co., by same, 68 bls. rags.
Atterbury & McKelvey, by same, 45 bls. rags.
E. J. Keller Co., Inc., Floridian, Kobe, 600 bls. rags.
W. Schall & Co., Belgenland, Antwerp, 8 bls. bagging.
J. Cohen, Son & Co., Inc., Verentia, London, 23 bls. rags.
E. J. Keller Co., Inc., Volendam, Rotterdam, 186 bls. rags.
Brown Bros. & Co., by same, 104 bls. rags.
E. Butterworth & Co., Inc., by same, 81 bls. bagging.
Seaboard National Bank, by same, 248 bls. rags.
E. J. Keller Co., Inc., Pittsburgh, Antwerp, 180 bls. flaxwaste.
E. J. Keller Co., Inc., Sierra Ventana, Bremen, 317 bls. rags.

OLD ROPE

Brown Bros. & Co., Rochambeau, Havre, 31 coils.
Brown Bros. & Co., A. Ballin, Hamburg, 29 coils.
Brown Bros. & Co., Cape Town Maru, Hamburg, 29 coils.
Brown Bros. & Co., Wells City, Bristol, 137 coils.
Brown Bros. & Co., Volendam, Rotterdam, 111 coils.

Brown Bros. & Co., by same, 22 bls.
New York Trust Co., Tyrifjord, Bergen, 74 bls.

MANILA ROPE

Equitable Trust Co., Pr. Hayes, Manila, 626 coils.

GLUESTOCK

G. W. Naylor, Jr., Carmania, Liverpool, 250 bags.

CASEIN

Atterbury Bros., Inc., Caracoli, Bordeaux, 234 bags.

CHINA CLAY

Armand & Co., Inc., Port Macquarie, London, 16 casks.

WOOD PULP

Castle & Overton, Inc., A. Ballin, Hamburg, 1,100 bls. woodpulp, 220 tons.
Castle & Overton, Inc., Stuttgart, Bremen, 270 bls. woodpulp.
Ira L. Beebe & Co., Inc., by same, 3,745 bls. woodpulp.
Castle & Overton, Inc., Cape Town Maru, Hamburg, 280 bls. woodpulp, 57 tons.
A. F. Kelly, by same, 700 bls. sulphite, 107 tons.
W. Hartman & Co., Inc., by same, 800 bls. cellulose, 123 tons.
J. Andersen & Co., Tyrifjord, Sarpsborg, 2,430 bls. sulphite.
Buck, Kiser & Co., Tyrifjord, Greaker, 125 bls. sulphite.
Merchants National Bank, by same, 500 bls. sulphite.
Pagel, Horton & Co., Inc., Skramstad, Husum, 10,200 bls. sulphite, 1,700 tons.
Bulkley, Dunton & Co., Skramstad, Iggesund, 1,500 bls. sulphite, 300 tons.
Bulkley, Dunton & Co., by same, 1,000 bls. sulphate, 200 tons.
Bulkley, Dunton & Co., by same, 120 bls. woodpulp, 20 tons.
J. Andersen & Co., by same, 1,600 bls. sulphite, 200 tons.

WOOD PULP BOARDS

Lagerloef Trading Co., A. Ballin, Hamburg, 329 rolls, 31 tons.
Lagerloef Trading Co., by same, 948 bls., 130 tons.

WOOD FLOUR

Corn Exchange National Bank, Tyrifjord, Flekkefjord, 1,000 bags, 50,600 kilos.

PHILADELPHIA IMPORTS

WEEK ENDING JULY 18, 1925

F. Weber & Co., Cape Town Maru, Hamburg, 28 cs. paper.
Corn Exchange National Bank, by same, 32 cs. paper.
Penn Rag & Metal Co., Pipestone Co., Havre, 245 bls. rags.
The Stone Bros. Co., Inc., by same, 482 bls. rags.
J. M. Jaffe, by same, 213 bls. rags.
S. Birkenstein & Sons, by same, 84 bls. rags.
Leipheimer & Nissmer, Pipestone Co., Dunkirk, 52 bls. cotton waste.
Baltimore Trust Co., Collamer, Bordeaux, 261 bls. rags.
E. J. Keller Co., Inc., by same, 178 bls. rags.
Penn Rag & Metal Co., by same, 138 bls. rags.
E. J. Keller Co., Inc., Collamer, St. Nazaire, 307 bls. rags.
The Stone Bros. Co., Inc., by same, 514 bls. rags.
Philadelphia National Bank, Prince Arthur, Alexandria, 292 bls. rags.
Philadelphia National Bank, Cape Town Maru, Hamburg, 53 bls. rags.
A. W. Fenton, Inc., by same, 314 bls. rags.
J. B. Moors & Co., by same, 32 bls. rags.
Castle & Overton, Inc., by same, 88 bls. rags.
Union National Bank, by same, 289 bls. rags.
S. Birkenstein & Sons, by same, 31 bls. bagging.
Levin, Mink & Son, by same, 216 bls. rags.
The Stone Bros. Co., Inc., Caracoli, Havre, 67 bls. rags.
National City Bank, by same, 57 bls. rags.
E. Chalmers, Incemore, Leith, 93 bls. rags.
G. M. Graves Co., by same, 202 bls. rags.
Penn Rag & Metal Co., Saucon, Oran, 202 bls. rags.
National City Bank, Cabo Torres, Leghorn, 40 bls. rags.
Bank of New York, by same, Valencia, 265 bls. rags.
R. Blank, by same, Marseilles, 87 bls. linseys.
The Stone Bros. Co., Inc., by same, 331 bls. rags.
E. J. Keller Co., Inc., by same, 104 bls. rags.
Katzenstein & Keene, Inc., by same, Barcelona, 146 bls. rags.
New York Trust Co., by same, 113 bls. rags.
E. J. Keller Co., Inc., Hektor, Marseilles, 100 bls. rags.
E. J. Keller Co., Inc., Hektor, Barcelona, 122 bls. rags.
E. J. Keller Co., Inc., J. L. Luckenbach, Kobe, 300 bls. rags.
National City Bank, London Exchange, London, 65 bls. rags.
New York Trust Co., by same, 73 coils old rope.
Anglo South American Trust Co., by same, 93 bls. rags.
A. H. Searle, Verentia, London, 163 bls. rags.
J. B. Moors & Co., by same, 461 bls. rags.
F. Whitaker & Co., M. Mariner, Manchester, 2 bls. rags.
J. G. Kitchen & Co., by same, 17 bls. rags.
Brown Bros. & Co., by same, 60 bls. paper stock.
Baring Bros. & Co., by same, 87 bls. bagging.
E. J. Keller Co., Inc., by same, 151 bls. bagging.
British Bank of South America, by same, 261 bls. rags.
Brown Bros. & Co., Deuel, Bremen, 198 bls. rags.
Union National Bank, by same, 379 bls. rags.
Brown Bros. & Co., Victorious, Kobe, 5 bls. cotton waste.
Union National Bank, by same, 60 bls. rags.
Southwark National Bank, by same, 25 bls. cotton waste.
Baltimore Trust Co., Attualita, Bremen, 61 bls. rags.
Brown Bros. & Co., by same, 232 bls. rags.
Fidelity International Trust Co., by same, 87 bls. rags.
J. B. Moors & Co., by same, 79 bls. rags.
New York Trust Co., Capulin, Leith, 92 bls. rags.
Castle & Overton, Inc., Breedyk, Rotterdam, 176 bls. rags.
Castle & Overton, Inc., Columbia, Italy, 277 bls. rags.
Castle & Overton, Inc., Ossa, Italy, 20 bls. rags.
Price & Pierce, Ltd., Malmen, Gothenburg, 1,200 bls. wood pulp.
Scandinavian Pulp Agency, Inc., by same, 254 bls. wood pulp.
Scandinavian Pulp Agency, Inc., by same, 1,175 bls. dry pulp.
Scandinavian Pulp Agency, Inc., by same, 229 bls. sulphate.

BALTIMORE IMPORTS

WEEK ENDING JULY 18, 1925

Baxter Paper Co., Carlshelm, Gothenburg, 87 bls. paper.
Johanson, Wales & Sparre, Inc., by same, 3,975 bls. wood pulp.
Johanson, Wales & Sparre, Inc., by same, 449 bls. dry soda pulp.
Johanson, Wales & Sparre, Inc., Malmen, Sundsvall, 510 bls. wood pulp.
Price & Pierce, Ltd., by same, 900 bls. wood pulp.
Parsons & Whittemore, Inc., Malmen, Frano, 785 bls. wood pulp.
Johanson, Wales & Sparre, Inc., by same, 3,000 bls. wood pulp.
Johanson, Wales & Sparre, Inc., Malmen, Gothenburg, 1,627 bls. wood pulp.
Parsons & Whittemore, Inc., by same, 200 bls. wood pulp.
Scandinavian Pulp Agency, Inc., by same, 2,261 bls. wood pulp.
Scandinavian Pulp Agency, Inc., Malmen, Skutskar, 7,000 bls. wood pulp.
Price & Pierce, Ltd., Skramstad, Wallvik, 8,490 bls. sulphite, 1,415 tons.
Price & Pierce, Ltd., Skramstad, Husum, 2,400 bls. sulphite, 400 tons.
Price & Pierce, Ltd., by same, 2,400 bls. sulphate, 400 tons.
Price & Pierce, Ltd., Skramstad, Obbola, 10,500 bls. sulphate, 1,500 tons.
Price & Pierce, Ltd., Skramstad, Iggesund, 500 bls. sulphate, 100 tons.
Ira L. Beebe & Co., Inc., Lorain, Hamburg, 400 bls. wood pulp.
Goldman, Sachs & Co., by same, 1,400 bls. wood pulp.
National City Bank, by same, 1,687 bls. wood pulp.
Mechanics & Metals National Bank, Median, Manchester, 96 bls. bagging.
Mechanics & Metals National Bank, by same, 72 bls. paper stock.
E. Butterworth & Co., Inc., Clairton, Liverpool, 76 bls. bagging.
Anglo South American Trust Co., Manchester, Manchester, 136 bls. rags.
S. Schapiro & Co., West Haven, Rotterdam, 2 bls. rags.

BOSTON IMPORTS

WEEK ENDING JULY 18, 1925

Merrimac Hat Corp., Sachem, Liverpool, 1 cs. glass paper.
Stone & Downer, West Haven, Antwerp, 23 cs. parchment paper.
Lee, Higginson & Co., by same, 25 bls. thread waste.
Maurice O'Meara Co., by same, 30 bls. bagging.
Forte Moran, by same, 111 bls. rags.
G. M. Graves Co., by same, 50 bls. rags.
Katz, Fleischer & Co., by same, 6 bls. bagging.
Second National Bank, by same, 206 bls. rags.
Baring Bros. & Co., by same, 417 bls. rags.
G. M. Graves & Co., West Haven, Rotterdam, 128 bls. rags.
J. T. Lodge & Co., Sachem, Liverpool, 17 bls. rags.
First National Bank of Boston, by same, 52 bls. rags.
Anglo South American Trust Co., Caledonian, Manchester, 77 bls. rag cuttings.
Merchants National Bank, by same, 18 bls. rags.
True & McClelland, by same, 5 bls. cotton waste.
T. D. Downing & Co., by same, 238 bls. rags.
New England Waste Co., by same, 15 bls. rags.
G. M. Graves Co., by same, 80 bls. rags.
National Shawmut Bank, by same, 7 bls. rags.
Baring Bros. & Co., by same, 458 bls. paper stock.
Baring Bros. & Co., by same, 371 bags hide cuttings.
Baring Bros. & Co., by same, 162 bls. rag cuttings.
Second National Bank, Cape Town Maru, Hamburg, 69 bls. rags.
G. M. Graves & Co., by same, 112 bls. rags.
Baring Bros. & Co., by same, 164 bls. rags.
A. W. Fenton, Inc., by same, 61 bls. rags.
E. J. Keller Co., Inc., Breedyk, Amsterdam, 99 bls. rags.
Train, Smith & Co., Breedyk, Rotterdam, 581 bags picker waste.
G. W. Millar & Co., by same, 559 bls. rags.
Reis & Co., by same, 10 bls. thread waste.
Chemical National Bank, by same, 110 bls. bagging.
Brown Bros. & Co., President Hayes, Marseilles, 112 bls. rags.
Upson Walton Co., by same, Manila, 310 pgs. rope.
English China Clays Sales Corp., China Maru, Fowey, 3,037 tons china clay in bulk.
English China Clays Sales Corp., by same, 420 tons china clay in casks.
Moore & Munger, by same, 927 tons china clay in bulk.
Moore & Munger, by same, 50 tons china clay in casks.
L. Gandolfi & Co., West Selene, Buenos Aires, 847 bags casein.
First National Bank of Boston, by same, 1,334 bags casein.
Johanson, Wales & Sparre, Inc., West Gotomska, Hernosand, 3,000 bls. sulphate pulp.
Pagel, Horton & Co., Inc., West Gotomska, Domsjo, 3,000 bls. sulphite pulp.
E. J. Keller Co., Inc., Breedyk, Manhein, 359 bls. wood pulp.
Castle & Overton, Inc., West Campgaw, Hamburg, 280 bls. wood pulp.
Ira L. Beebe & Co., by same, 2,165 bls. wood pulp.
H. L. Dodge & Co., Cape Town Maru, Hamburg, 54 bls. wood pulp boards.

New York Market Review

OFFICE OF THE PAPER TRADE JOURNAL,
Wednesday, July 22, 1925

As July slips away day by day, the paper men have more and more reason to feel satisfied with the conditions which are marking the mid-season business in the paper market. On cannot speak of business as by any means being brisk but when it is contrasted with the slackness of July, 1924 there is found abundant proof that the market is really on a more substantial basis than it has been on for a long time. Buying continues to be cautious and the fact that such business as is being placed is only for immediate needs shows that there is a steady consuming demand which reflects the real conditions better than material orders or anything in the line of financial transactions could do. The month which is decidedly the off month of them all is near its end and orders continue to flow in with clock-work regularity. Practically all orders are small but the number of these orders keeps the market occupied and prevents excessive brooding over the summer's dearth of business. It is extremely unlikely that August will develop any very unhealthy conditions after July has stood up so bravely against the obstacle of hot-weather, vacations, etc. It is practically certain that next month will register as great an improvement over August, 1924 as July has over the same month of last year. In consideration of these facts it may be fairly said that the paper men have not for a long time had such justification for a hopeful forward-look as they have today. There is nothing to threaten the Autumn business prospects and unless something unlooked for occurs 1925 will wind up in a great deal better shape than it has promised to do at some stages of the game. The greatest obstacle to first rate business is the cautious buying attitude which has prevailed for so long a time. This has continued for so long a time that it is becoming almost a habit and, while proper caution is a commendable characteristic, over-caution is not only a detriment to business in general but it is apt to prove a boomerang to the individual practicing it. It is to be hoped, for more reasons than one, that when the Fall season opens the lines of caution will not be drawn too close.

News print has not sagged with its accustomed summer shrinkage. Consumption is, of course, being cut in most quarters by the newspapers but in the metropolitan area at any rate the papers are not dwindling materially in size. There is no question but that circulation has dropped off due to the vacation absences but most of the papers have been trying to guard against such a shrinkage by stimulating circulation schemes and these have had the effect of keeping circulation figures closer to their top mark than is usual.

Fine papers are not over active but the demand is steady. Coarse papers are not doing so well but are much better off than they were last year. The figures are not available but it is believed that the business being done in summer specialties will run very close to a record this year. The weather has been unusually favorable for outings, picnics and all outdoor events and this has played into the hands of those engaged in the manufacture of summer specialties.

Mechanical Pulp

The mechanical pulp market is seeing a fair activity. The market is not over-stocked—at least, not to an extent where the producers find it necessary to unload at any cost. Summer droughts have held off well this year but they are a practical certainty sooner or later and the producers are always planning to meet such an emergency when it comes. It stands them well in hand to have an abundant stock to carry them through such a period when it comes.

Chemical Pulp

Caution marks the trading in the chemical pulp market and while there is an aversion to buying for the future, the business is forthcoming in fairly frequent shape although the business is not inclined to be large in volume. The prices are being rigidly maintained and where concessions are obtained there are apt to be unusual conditions to account for it.

Rags

Buying of rags is fairly well distributed among the various items with a few chosen grades coming in for a very superior demand. Orders are coming through slightly better than they have been doing which is probibly due to the fact that many of the mills have got through their inventory slow-up and have resumed their call for stock. Prices are remaining where they were with only an occasional change.

Old Rope and Bagging

Old bagging is doing very well just now with roofing bagging heading the list in demand. Business lags in old rope and although it has been anticipated that prices might come down by this time they are holding firm and may go through the rest of the summer without a drop.

Waste Paper

Prices are not changing in waste paper and there has been no material change in conditions during the past week. The demand is inclined to be slow and not much of a pick-up is looked for for several weeks to come.

Twine

Twine is not showing any new energy and the market is very nearly flat. The few orders which find their way into the market are for small quantities and the twine men are having it nearly as quiet as they did a year ago.

Printers Are Shown How Paper Is Made

[FROM OUR REGULAR CORRESPONDENT]

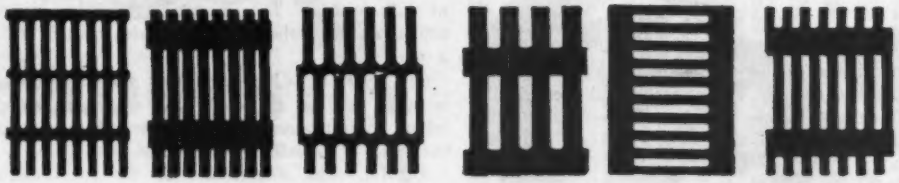
DENVER, Colo., July 20, 1925.—F. A. Franklin of the Butler Paper company entertained the Denver club of the Printing House Craftsmen at its monthly meeting held at the Smith-Brooks Printing company's establishment, during the evening of July 15.

Mr. Franklin, lecturing on how paper is made, showed four reels of film, in connection with his remarks. The speaker and his photographs traced the manufacture of paper from start to finish. The rags, wood pulp, various materials used were all shown and the use of each told.

The club was but recently organized. A drive for membership will be launched so that any person actually engaged in printing or the allied trades will be eligible. A regular feature of the meetings will be a question box so that questions may be placed and answered. More education. E. C. Sterry is the president of the club.

PERFORATED METALS

All sizes and shapes of Holes



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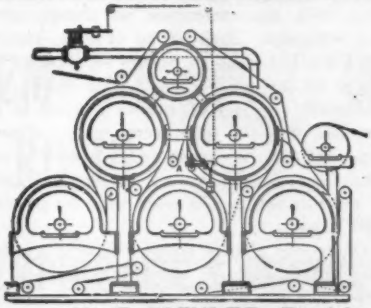

Reasons why you should have it on your machine are: First, it regulates the drying of paper automatically, irregularities are eliminated; second, higher machine finished papers are attainable, because it is possible to maintain the proper quantity of moisture in sheet, as it passes to calenders; third, mills having tried it on one machine have ordered it for all their machines. Full particulars upon application to

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Miscellaneous Markets

OFFICE OF THE PAPER TRADE JOURNAL,
Wednesday, July 22, 1925.

Although the chemical market has settled down to a state of mild interest, yet there is every reason why the chemical men should feel reassured over conditions. They have dug far enough into the summer now so that they can feel they know the worst and that worst is not as bad as some of them had feared it would be. Three weeks of July are gone and it is fair to take the transactions of that period as a more or less accurate index of what the summer will develop. On the whole, things are decidedly better than they were a year ago this time and it is almost certain that the business, taken day for day, will prove better right through to September than it was during the trying period of 1924. It is a fact that contract withdrawals are proving better this month than they were in June. Bleach may be taken as an illustration of this condition. In June the consumers were cutting down their withdrawals while today they are taking out their contract quotas with accustomed regularity. Spot demand is, of course, at a minimum but that is a direct consequence of summer and it was expected to be so as it always is. Prices are holding up and so far are showing no indication of going lower. As has already been said in these columns the market is in a receptive mood for business but it is not over avaricious. So far it has steered clear of the slogan "Business at any cost" and consequently concession-making is not general and the market continues on a good substantial basis. The consumer who has good business to place can probably find where he can get prices shaded a trifle but prices are not being butchered for the sake of securing every stray bit of business which makes a play for concessions. There is only a little more than a month left before the better buying period will begin and it looks as though the chemical market would emerge from the summer dull period in a great deal better shape than was genearlly expected.

BLANC FIXE.—Blanc fixe has undergone no change since this report was written a week ago. Such buying as it experiences is of a limited order and the hot weather cannot be expected to see the demand stimulated to any great extent. Concessions are not general and the consumers are in too cautious a mood to be bowled over by concessions even if they were freely offered. When the condition blanc fixe was in a year ago this time is recalled, its 1925 record may be considered a very commendable one. The pulp is still quoted at from $60 to $70 a ton with the powder bringing from $75 to $90 a ton.

BLEACHING POWDER.—As already stated bleaching powder is moving along on contract schedule in excellent shape. It is not only doing much better than it was last summer but consumers are now taking their contract quotas whereas in June they were cutting down on their contract allowances. All in all the demand is keeping the stock moving satisfactorily. It is quoted at 1.90 cents a pound.

CAUSTIC SODA.—There is no great interest in caustic soda just now although the demand is just about sufficient to keep the market supply at a consistent level. Most of the business is, of course, on the contract basis for here spot buying is a rarity as it is with most of the chemicals at this time. The quotation remains at from 3.10 to 3.15 cents a pound.

CASEIN.—Casein has slowed down considerably and in that is only running true to form. Its record is better than its 1924 record, however, and September promises to bring it into line with some really superior business. It is still quoted at 12½ cents a pound, with an opportunity for the consumer with worth while business to get a shade the better of that price if he searches energetically enough for the opportunity.

CHINA CLAY.—The China Clay demand has practically settled down to the routine business which has to be placed for immediate needs. This commodity, however, has had such a favorable run that it may be spoken of as "sitting pretty" even in these days of dull demand. The imported grades are bringing from $16 to $20 a ton with the domestic grades quoted at from $12 to $15 a ton.

CHLORINE.—Chlorine is very slow at this time but the price is being held to so rigidly that consumers report their absolute failure to secure anything in the way of concessions for proffered business. It is selling at from $4.50 to $7.00 a pound in tanks.

ROSIN.—The sluggishness of the rosin market is becoming more and more pronounced but rosin, like China clay, does not have to worry a great deal for it has had a phenomenal run of business that entitles it to a little vacation. The price is down a trifle, the naval store centers quoting it at from $6.40 to $6.60.

SALT CAKE.—Salt cake is moving very slowly, there being no spot demand to stimulate it. It has not slumped materially since a week ago, however, and is now probably at its lowest point of demand for the season. The price of from $16 to $17 a ton is being well maintained.

SODA ASH.—Soda ash is also depending on its contract business to carry it along and this is sufficient to keep the stock moving fairly well. It is still quoted at 1.38 cents a pound on a flat basis at the works.

SULPHATE OF ALUMINA.—Sulphate of alumina is moving along in its regular channel, contract business being satisfactory but spot buying being of a superficial character. Bad as it is, it is doing considerably better than its July business for last year. The commercial grades are quoted at from 1.40 to 1.45 cents a pound at the Eastern works and the iron free at from 2.10 to 2.25 cents a pound.

SULPHUR.—Sulphur consumers are drawing out their supplies on contract with regular consistentcy. The price is from $19 to $20 a ton.

TALC.—Talc continues to hold its own. It is by no means in very vigorous condition but it is considerably more active than it was last year at this time. It is quoted at from $17 to $18 a ton.

Notes and Jottings of the Toronto Industry

A. D. Toy, of the Canada Paper Company, Toronto, is spending his holidays at Barrie, Orillia and other Ontario points.

C. W. Paul, manager of the Hamilton branch of the United Paper Mills, Toronto, has returned from spending his vacation at Owen Sound.

A. T. Brown, of E. Pullan, Limited, and W. B. Christie, of the Hinde and Dauch Paper Company, Toronto, accompanied by their wives, have gone on a motor tour to the Maine Coast.

S. F. Duncan, treasurer of the Provincial Paper Mills, has returned to Toronto after a business trip to the Port Arthur plant of the company.

C. De Wolf Reid, Montreal, representing the Western Quebec Paper Mills, St. Andrews East, Que., spent a few days last week calling upon the trade in Toronto.

C. Hill, of the sales department of the Warren Manufacturing Company, New York City, was in Toronto lately transacting business.

C. **Frank Huges,** Ontario salesman for the Allen Paper Company, Toronto, is holidaying at the Kawartha Lakes. Thomas J. Boddy, city representative of the Allen Paper Company is spending a few days among the Muskoka Lakes.

Miss K. Flanagan, of the Hinde and Dauch Paper Company, baseball team, champions of Toronto, has gained a place among the Canadian girl athletes, who have gone to England to take part in sports and will run in the hundred yards race and also the half mile contest. The Hinde and Dauch ball team is heading the soft ball league in Toronto so far this season and expects to capture the pennant again.

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Market Quotations

Quoted by Hepburn & Co., No. 74 Broadway, N. Y. City, to whom all inquiry for quotations on these or any other Securities is referred.

BONDS	BID	OFFERED
Abitibi Power and Paper, Gen. 6s 1940	101	103*
Advance Bag and Paper, 7s 1943	98	100*
Bastrop Pulp and Paper, 7½s 1932	104	108*
Brompton Pulp and Paper, 6s 1927	94	96
Beaver Board, 8s 1933	92	94
Bedford Pulp and Paper, 6½s 1942	98	...
Berkshire Hills Paper Co., 8s 1941	...	80
Beaver Board, N. Y. Curb, 8s 1933	93	95
Beaver Products Corp., 7½s 1942	104	106
Belgo Canadian Paper, 6s 1943	100	101
Brown Paper Co., 8s 1931	102	...
Berlin Mills, 5s 1931	98	...
Bryant Paper Co., 6s 1942	98	101
Brown Company Serial, 6s 1925-43	97	100
Central Paper, 6½s 1925-42	91	94
Cape Breton Pulp and Paper, 6s 1932	100	...
Carthage Sulphite Pulp and Paper, 8s 1941	40	50
Champion Coated Paper Co., 6s 1924-34	...	102
Champion Fibre Co. Notes, 8s 1930	101	...
Cherry River Paper, 5s 1929	97	100*
Donnaconna Paper Co., Ltd., 6s 1940	99	101
Eddy Paper, 7s 1931	97	...
Eagle Paper, 6½s 1932	96	100
Escanaba Paper, 6s 1933	87	95*
Fox River Paper, 7s 1931	100	...
Fort Orange Paper Co, 7s 1942	95	99
Eddy Paper Co., 7½s 1931	95	...
Gilbert Paper Co., 7s 1927	96	...
Gilbert Paper Co., 6½s 1923-29	101	102*
Hammermill Paper Co., 6s 1930-39	99	...
Hercule Corp'n, 8s 1936	99	102
Hummell, Ross Fibre Corp., 7s 1925	90	...
Jessup & Moore Paper Co., 6s 1939	90	97
Kenmore Pulp and Paper Co., 6s 1937	90	...
Lake Superior Pulp and Paper, 6s 1941	105	...
Mattagami Pulp and Paper, 6s 1937	90	...
Marinette & Menominee, 7½s 1936	104	...
National Paper and Type, 6s 1947	96	99*
Oswego Falls Corp., 8s 1942	102	105
Orono Pulp and Paper, 5s 1941	93	96*
Orono Pulp and Paper, 6s 1943	97	100*
Oxford Paper Co., 6s 1947	101	...
Paterson Parchment Paper, 5½s 1927-28	98	100
Paterson Parchment, 6s 1938	98	100
Parker, Young Co., 6½s 1944	92	96
Price Bros. & Co., Ltd., 6s 1943	100	102
Provincial Paper Mills, Ltd., 6s 1940	97	...
Riordon Co., Series A, 8s 1940	115	118
Riordan Paper, 6s 1924	95	...
Riordan Pulp and Paper, Ltd., 6s, 1929	33	35
River Raisin Paper, 8s 1936	104	106
St. Maurice Paper Co., Ltd., 5½s, 1929	98½	99¾
St. Regis Paper, 6½s, 1929-35	97	102
Smith (Howard) Paper Mills, 7s 1941	98	100
Smith (Howard) Paper Mills, 6s 1934	98	...
St. Croix Paper, 5s 1923-37	95	...
Stevens & Thomson Paper, 6s 1942	88	92
Spanish River Pulp and Paper, 6s 1931	105	108
Spanish River Pulp and Paper, Gen 8s 1941	106	109
Ticonderoga Pulp and Paper Co., 6s, 1940	91	95
Ticonderoga Pulp & Paper 1-5, 1930	88	93
S. D. Warren Company, 6s, 1945	97	100
Whittaker Paper, 1st 7s 1942	96	...
Watab Paper Co., 6½s 1942	101	...
Waterway Paper Products, 7s 1924-27	95	100
Wayagamack Pulp and Paper, Ltd., 6s 1951	87	90

STOCKS	BID	ASKED
Abitibi Power and Paper, Com	66	68
Abitibi Power and Paper, Pfd	108	...
Advance Bag and Paper, Com	8	12*
Advance Bag and Paper, Pfd	77	...
Beaver Board, Com	4	6
Beaver Board, Pfd	34	38
Bryant Paper, Cap	12	...
Bryant Paper, Pfd	9	...
Brompton Pulp and Paper, Cap	20	23
Chicago Mill & Lumber Co., Com	63	...
Chicago Mill & Lumber Co., Pfd	98	104
Crown Williamette, Com	93	98*
Crown Williamette, 7% A, Pfd	98	SW
Donnaconna Paper, Pfd	95	100
Great Northern Paper, Cap	260	270
Jessup & Moore Paper, pfd	73	77
International Paper Co., Com	68	69
International Paper Co., Pfd. 6%	78	80
Mengel Company, Com	64	68
Mengel Company, Pfd	83	93
Oxford Papers, Com	93	97
Oxford Paper Co., Pfd	98	...
Provincial Paper Co., Com	94	98
Provincial Paper Co., Pfd	99	...
Price Brothers, Cap	39	40
St. Croix Paper	185	215
St. Maurice Paper Co., Cap	83	87
St. Regis Paper Co., Cap	54	56
Spanish River Pulp and Paper, Com	104	105
Spanish River Pulp and Paper, Pfd	115	117
Ticonderoga Pulp and Paper, Cap	145	...
West Virginia Pulp and Paper. Cap	44	47
West Virginia Pulp and Paper, Pfd	95	...
Whittaker Paper, Com	53	...
Whittaker Paper, Pfd	15	...

* Nominal.

Paper

(F. o. b. Mill)

Ledgers	11.00	@38.00
Bonds	9.00	@45.00
Writings—		
Extra Superfine	14.00	@32.00
Superfine	14.00	@32.00
Tub Sized	10.00	@15.00
Engine Sized	8.00	@11.00
News—		
Rolls, contract	3.50	@ 3.90
Rolls, transit	3.75	@ 4.25
Sheets	4.00	@ 4.25
Side Runs	3.25	@ 4.00
Book, Cased—		
S. & S. C.	7.00	@ 9.75
M. F.	6.25	@ 8.75
Coated and Enamel	8.00	@15.00
Lithograph	8.00	@15.00
Tissues—Per Ream		
White No. 1	.70	@ .90
Colored	1.00	@ 2.00
White No. 2	.65	@ .75
Anti-Tarnish	1.25	@ 2.35
Kraft	.85	@ .95
Manila	.70	@ .80
Kraft—		
No. 1 Domestic	5.50	@ 6.25
No. 2 Domestic	4.25	@ 4.50
Imported	5.50	@ 5.75
Manila—		
No. 1 Jute	9.25	@ 9.50
No. 2 Jute	7.75	@ 8.50
No. 1 Wood	4.75	@ 5.25
No. 2 Wood	4.00	@ 4.50
Butchers	3.50	@ 4.00
Fibre Papers—		
No. 1 Fibre	4.50	@ 5.00
No. 2 Fibre	4.25	@ 4.75
Common Bogus	2.50	@ 2.75
S. Screening	3.00	@ 3.50
Card Middler	4.00	@ 5.00
Boards—per ton—		
News	45.00	@47.50
Straw	57.00	@60.00
Chip	42.00	@45.00
Binders' Boards	72.50	@77.50
Sgl. Mla. Lt. Chip	60.00	@62.50
Wood Pulp	70.00	@75.00
Container	62.50	@67.50
Sulphate Screenings—		
Coarse	.75	@ .85
Refined	1.75	@ 2.00
Ground Wood—		
Screenings	20.00	@25.00
Glassine—		
Bleached, basis 25 lbs.	13.00	@16.00
Bleached, basis 20 lbs.	15.00	@16.00

Mechanical Pulp

(Ex-Dock)

No. 1 Imported	33.00	@37.00

(F. o. b. Mill)

No. 1 Domestic	28.00	@32.00

Chemical Pulp

(Ex-Dock, Atlantic Ports)

Sulphite (Imported)—		
Bleached	4.00	@ 4.50
Easy Bleaching	2.90	@ 3.25
No. 1 strong unbleached	2.75	@ 3.25
No. 2 strong unbleached	2.45	@ 2.75
No. 1 Kraft	2.95	@ 3.20
Sulphate—		
Bleached	3.75	@ 3.95

(F. o. b. Pulp Mill)

Sulphite (Domestic)—		
Bleached	3.75	@ 4.50
Easy Bleaching Sulphite	2.90	@ 3.25
News Sulphite	2.55	@ 2.80
Mitscherlich	3.25	@ 3.75
Kraft (Domestic)	2.75	@ 3.25
Soda Bleached	4.00	@ 4.25

Domestic Rags

New Rags

Prices to Mill, f. o. b. N. Y.

Shirt Cuttings—		
New White, No. 1	14.50	@15.25
New White, No. 2	8.00	@10.00
Silesias No. 1	10.50	@11.50
New Unbleached	14.00	@15.00
Washables	6.50	@ 9.25
Fancy	9.75	@10.25
Blue Overall	10.25	@11.25
New Blue Prints	7.50	@ 8.50
New Soft Blacks	5.75	@ 6.20
Mixed Khaki Cuttings	5.75	@ 6.25
Pink Corset Cuttings	10.50	@11.00
Pink Muslin	10.35	@10.75
New Light Seconds	3.25	@ 3.50
O. D. Khaki Cuttings	6.25	@ 7.25
Men's Corduroy	6.25	@ 6.75
New Mixed Blacks	4.00	@ 4.50
Old Rags		
White, No. 1—		
Repacked	6.50	@ 7.50
Miscellaneous	6.50	@ 7.00
White, No. 2—		
Repacked	4.50	@ 4.75
Miscellaneous	4.00	@ 4.50
St. Soiled, White	3.00	@ 3.50
Thirds and Blues—		
Repacked	4.00	@ 4.25
Miscellaneous	3.25	@ 3.50
Black Stockings	4.00	@ 4.50
Roofing Rags—		
Cloth Strippings	2.40	@ 2.50
No. 1	2.30	@ 2.40
No. 2	2.30	@ 2.40
No. 3	2.00	@ 2.25
No. 4	2.20	@ 2.30
No. 5A	1.80	@ 1.50

Foreign Rags

New Light Silesias	9.50	@10.50
Light Flannelettes	10.50	@11.50
Unbl'ched Cottons	14.00	@15.00
New White Cuttings	14.00	@15.00
New Light Oxfords	10.00	@11.00
New Light Prints	9.00	@10.00
New Mixed Cuttings	4.25	@ 4.50
New Dark Cuttings	4.00	@ 4.25
No. 1 White Linens	10.00	@11.00
No. 2 White Linens	7.25	@ 8.25
No. 3 White Linens	6.25	@ 6.75
No. 4 White Linens	4.50	@ 5.50
Old Extra Light Prints	4.25	@ 4.75
Ord. Light Prints	3.75	@ 421
Med. Light Prints	3.75	@ 4.25
Dutch Blue Cottons	4.00	@ 4.50
Ger. Blue Cottons	4.00	@ 4.25
Ger. Blue Linens	425	@ 4.75
Checks and Blues	3.50	@ 3.75
Linsay Garments	2.45	@ 2.50
Dark Cottons	2.35	@ 2.45
Shoppery	2.25	@ 2.35
French Blues	4.00	@ 4.50

Bagging

Prices to Mill F. o. b. N. Y.

Gunny No. 1—		
Foreign	3.15	@ 3.25
Domestic	3.15	@ 3.25
Wool Tares, light	2.50	@ 2.60
Wool, Tares, heavy	2.60	@ 2.70
Bright, Bagging	2.55	@ 2.65
Mixed Bagging	2.30	@ 2.40
Sound Bagging	2.10	@ 2.20
Roofing Bagging	1.85	@ 2.00
Manila Rope—		
Foreign	6.25	@ 6.75
Domestic	6.75	@ 7.25
New Bu. Cut	3.60	@ 3.85
Hessian Jute Threads—		
Foreign	4.00	@ 4.25
Domestic	3.25	@ 3.50

Old Waste Papers

(F. o. b. New York)

Shavings—		
Hard, White, No. 1	3.40	@ 3.60
Hard, White, No. 2	3.15	@ 3.40
Soft, White, No. 1	2.70	@ 2.80
Flat Stock—		
Stitchless	1.45	@ 1.55
Overissue Mag	1.25	@ 1.40
Solid Flat Book	1.40	@ 1.50
Crumpled No. 1	1.25	@ 1.35
Solid Book Ledger	1.70	@ 1.80
Ledger Stock	1.40	@ 1.50
New B. B. Chips	.65	@ .75
Manilas—		
New Env. Cut	2.25	@ 2.40
New Cut. No. 1	1.75	@ 2.00
Extra No. 1 old	1.40	@ 1.50
Print	1.20	@ 1.30
Container Board	.70	@ .90
Bogus Wrapper	1.00	@ 1.10
Old Krafts Machine compressed bales	2.00	@ 2.10
News—		
No. 1 White News	1.85	@ 2.00
Strictly Overissue	1.05	@ 1.15
Strictly Folded	.75	@ .85
No. 1 Mixed Paper	.55	@ .65
Common Paper	.35	@ .45

Twines

Cotton—(F. o. b. Mill)—		
No. 1	.42	@ .45
No. 2	.41	@ .43
No. 3	.40	@ .43
India, No. 6 basis—		
Light	.19	@ .20
Dark	.17	@ .19
B. C., 18 basis	.39	@ .41
A. B. Italian, 18 Basis	.56	@ .58

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Dark, 18 basis...	.30	@	.31
Light, 18 basis...	.28	@	.30
Jute Wrapping, 3-6 Ply—			
No. 1	.18	@	.20
No. 2	.18	@	.20
Tube Rope—			
4-ply and larger.	.15	@	.17
Fine Tube Yarn—			
5-ply and larger.	.20	@	.28
4-ply	.21	@	.24
3-ply	.22	@	.25
Unfinished India—			
Basis	.14	@	.15
Paper Makers' Twine Balls	.12	@	.13
Box Twine, 2-3 ply	.14	@	.15
Jute Rope	.20	@	.40
Amer. Hemp, 6....	.30	@	.32
Sisal Hay Rope—			
No. 1 Basis.....	.14	@	.16
No. 2 Basis.....	.10	@	.12
Sisal Lath Yarn—			
No. 1	.14	@	.15
No. 2	.11	@	.13
Manila Rope	.18	@	.19

CHICAGO

Paper

	F. o. b. Mill		
All Rag Bond.....	35	@	40
No. 1. Rag Bon...	25	@	35
No. 2 Rag Bond..	14	@	25
Water Marked Sulphite	9	@	12
Sulphite Bond.....	7	@	10¾
Sulphite Ledger ...	9	@	12
Superfine Writing..	18	@	24
No. 1 Fine Writing	14	@	18
No. 2 Fine Writing	12	@	14
No. 3 Fine Writing	9	@	12
No. 1 M. F. Book..	5½	@	7½
No. 1 S. & S. C. Book	6	@	7¾
Coated Book	8	@	10
Coated Label	8	@	10
News—Roll, mill...	3½	@	4¼
News—Sheets, mill.	3¾	@	4¾
No. 1 Manila.....	4½	@	5½
No. 1 Fibre.....	4¼	@	4¾
No. 2 Manila.....	3¾	@	4¼
Butchers' Manila...	3.60	@	4.00
No. 1 Kraft.....	5¾	@	6¼
No. 2 Kraft (Southern Grade).....	4	@	4½
No. 2 Kraft (Northern Grade).....	4¾	@	5
Wood Tag Boards..	4	@	6
Sulphite Screenings.	2.75	@	3.00
Manila Tissue, 24x36 sheet	7	@	7½
White Tissue, 20x30 sheet	7	@	7¾
Boards, per ton—			
(Delivered Central Territory)			
Plain Chip 45.00		@	47.50
Solid News 47.50		@	50.00
Manila Line Chip.57.50		@	60.00

Container Lined—
(Delivered Central Territory)

85 Test	—	@	75.00
100 Test	—	@	80.00

Old Papers

F. o. b. Chicago

Shavings—			
No. 1 Hard White	3.15	@	3.25
White Envel. Cuttings.....	3.15	@	3.25
No. 1 Soft Shav.	2.65	@	2.75
No. 1 Mixed.....	1.45	@	1.50
No. 2 Mixed.....	1.15	@	1.20
Ledger and Writings	1.50	@	1.55
Solid Books	1.40	@	1.45
No. 1 Light Books.	1.00	@	1.05
Blanks	1.90	@	1.95
Kraft	2.05	@	2.10
New Kraft Cuts.	2.30	@	2.35
Manila Envelope Cuttings.....	2.40	@	2.50
Ex. No. 1 Manila..	2.00	@	2.10
Print Manila	.90	@	.95
Folded News (overissue)	.85	@	.90
Old Newspapers—			
No. 1	.70	@	.75
No. 2	.60	@	.65
Mixed Papers—			
No. 1	.55	@	.60
No. 2.....	.50	@	.55
Straw Clippings....	.75	@	.80
Binders' Clippings..	.70	@	.65
Roofing Stock, f. o. b. Chicago, Net Cash—			
No. 1.....47.00		@	52.00
No. 2..... 45.00		@	50.00
No. 3..... 43.00		@	48.00
No. 4..... 41.00		@	46.00

BOSTON

Paper

Ledgers—			
Sulphite	.08½	@	.18
Rag content	.18	@	.36½
All Rag	.38	@	.50
Bonds—			
Sulphite	.07½	@	.10½
Rag Content.....	.17	@	.45
All Rag	.36½	@	.51
Writings	.08	@	.20
Superfines	.22	@	.50
News	.04	@	.04½
Book, Super	.08	@	.10
Book, Coated	.09	@	.14
Coated Litho.....	.09½	@	.15
Label	.09½	@	.15
Jute Manila No. 1.	.11	@	.12
Manila, Sul. No. 1.	.05	@	.05
Manila, Sul. No. 2.	.03¾	@	.04¼
No. 1 Kraft	.06¼	@	.06½
No. 2 Kraft	.05¾	@	.05½
Common Bogus	.03½	@	.04
Straw Board	—	@	50.00
News Board	—	@	45.00
Chip Board	—	@	42.50
Single Manila Pulp lined board.....55.00		@	60.00
Single White, patent coated board.....75.00		@	82.50
Wood Pulp Board..80.00		@	85.00
Binder Boards 75.00		@	85.00
Tarred Felts—			
Regular 61.00		@	63.00
Slaters 66.00		@	68.00
Best Tarred, 1 Ply, roll	1.50	@	1.60
Best Tarred, 2 Ply, roll	1.70	@	1.80
Best Tarred, 3 Ply, roll	2.00	@	2.10

Old Papers

Shavings—			
No. 1 Hard White	4.00	@	3.75
White Blank News.	1.75	@	2.00
Manila Env. Cuttings.....	2.80	@	3.00
No. 2 Hard White	3.25	@	3.50
No. 1 Soft White..	.04½	@	—
No. 2 Soft White..	.03¾	@	—
No. 1 Mixed.....	1.60	@	1.75
No. 2 Mixed.....	1.25	@	1.50
Solid Ledger Stock.	2.00	@	1.75
Writing Paper	—	@	1.50
No. 1 Books, Heavy	1.75	@	1.50
No. 1 Books, Light	—	@	1.25
No. 1 New Manila.	2.50	@	2.60
No. 1 Old Manila.	1.75	@	2.00
Print Manila	1.05	@	1.20
Old Kraft	2.00	@	2.25
Overissue News....	1.00	@	6.54
Old Newspapers....	.70	@	5.54
No. 1 Mixed Paper	.60	@	.47½
Box Board, Chip..	.60	@	.50

Bagging

Price f. o. b. Boston

Gunny No. 1—			
Foreign	—	@	3.00
Domestic	—	@	3.25
Manila Rope.....	6.00	@	6.50
Mixed Rope.....	1.50	@	2.25
Scrap burlaps....	—	@	2.25
Wool Tares, heavy.	—	@	3.00
Mixed Strings...	—	@	2.25
New Burlap Cuttings	—	@	3.75

Domestic Rags (New)

Price f. o. b. Boston

Shirt Cuttings—			
New White No. 1	.15½	@	.15
Silesias, No. 1..	.11	@	—
New Unbleached.	.14½	@	.15
Washable	.07¾	@	.08
Fancy	.10½	@	—
Cottons—According to Grades—Blue—			
Blue overalls....	.12½	@	—
New Black, soft...	.07	@	—
Khaki Cuttings....	.07	@	—
Corduroy	.04	@	.05
New Canvas.....	.12	@	.13½

Domestic Rags (Old)

Price f. o. b. Boston

White No. 1.....10.00		@	—
Repacked	9.50	@	—
Miscellaneous	8.50	@	—
White No. 2—			
Repacked	6.50	@	—
Miscellaneous ...	5.25	@	—
Thirds and Blues—			
Repacked	5.00	@	—
Miscellaneous ...	3.50	@	—
Roofing Stock—			
No. 1.....	3.00	@	—
No. 2.....	2.00	@	—
No. 3.....	2.50	@	—
No. 4.....	2.00	@	—

PHILADELPHIA

Paper

Bonds	.07	@	.40
Ledgers	.11	@	.40
Writings—			
Superfine	.13	@	.18
Extra fine	—	@	.22
Fine	.20	@	.26½
Fine, No. 2.....	.16	@	.25
Fine, No. 3.....	.12	@	.20
Book, M. F.....	.06	@	.07
Book, S. S. & C..	.06	@	.07½
Book, Coated	.11	@	.16
Coated Lithograph..	.09	@	.12
Label	.09	@	.12
News	.03½	@	.04
No. 1 Jute Manila.	.09½	@	—
Manila Sul., No. 1.	.04½	@	.06
Manila No. 2.....	.04	@	.04½
No. 2 Kraft.....	.05	@	.05½
No. 1 Kraft.....	.06¼	@	—
Common Bogus.....	.02¾	@	—
Straw Board.....56.00		@	55.00
News Board 42.50		@	—
Chip Board 42.50		@	—
Wood Pulp Board.. 4.50		@	5.00
(Carload Lots)			
Binder Boards—			
Per ton 75.00		@	80.00
Carload lots 65.00		@	70.00
Tarred Felts—			
Regular 61.00		@	63.00
Slaters 66.00		@	68.00
Best Tarred, 1-ply (per roll)	1.70	@	1.80
Best Tarred, 2-ply (per roll)	1.50	@	1.60
Best Tarred, 3-ply.	2.00	@	2.10

Bagging

F. o. b. Phila.

Gunny, No. 1—			
Foreign	3.00	@	3.25
Domestic	3.00	@	3.25
Manila Rope.....	4.75	@	6.00
Sisal Rope	2.50	@	—
Mixed Rope	1.00	@	1.25
Scrap Burlaps....	2.25	@	2.50
Wool Tares, heavy.	2.00	@	2.13
Mixed Strings...	1.25	@	—
No. 1, New Lt. Burlap	3.50	@	3.75
New Burlap Cuttings	3.75	@	—

Old Papers

F. o. b. Phila.

Shavings—			
No. 1 Hard White	3.50	@	3.60
No. 2 Hard White	3.00	@	3.25
No. 1 Soft White	2.50	@	2.60
No. 2 Soft White	1.75	@	—
No. 1 Mixed....	1.00	@	1.10
No. 2 Mixed....	.90	@	1.00
Solid Ledger Stock.	1.75	@	1.90
Writing Paper.....	1.60	@	1.65
No. 1 Books, heavy	1.25	@	—
No. 2 Books, light.	1.00	@	—
No. 1 New Manila.	1.50	@	1.75
No. 1 Old Manila..	1.25	@	1.50
Container Manila ..	.85	@	.90
Old Kraft	2.00	@	2.10
Over issue News...	.90	@	.95
Old Newspaper....	.40	@	.50
No. 1 Mixed Paper	.40	@	.50
Common Paper.....	.30	@	.35
Straw Board, Chip.	.60	@	.65
Binders Bd., Chip..	.60	@	.65

Domestic Rags—New.
Price to Mill, f. o. b. Phila.

Shirt Cuttings—			
New White, No. 1	.13½	@	.14
New White, No. 2	.06½	@	—
Silesias, No. 1...	.10½	@	.11
New Unbleached.	.14	@	.14½
Washable	.07¾	@	.08¼
Fancy	.09½	@	.10
Cottons—according to grades—			
Blue Overall....	.11	@	.11½
New Blue	.04	@	.04¼
New Black Soft.	.06	@	.06¼
New Light Seconds	.03½	@	.03¾
Khaki Cuttings..	.06½	@	.07
Corduroy	.04	@	.04½
New Canvas	.08¾	@	.09
New Black Mixed	.05	@	.05¼

Old

White, No. 1—			
Repacked	6.75	@	7.00
Miscellaneous ...	6.25	@	6.50
White, No. 2—			
Repacked	.05	@	.05¼
Miscellaneous ...	.04¼	@	.05
Thirds and Blues—			
Repacked	3.75	@	4.00
Miscellaneous ...	3.15	@	3.25
Black Stockings..	4.25	@	4.50
Roofing Stock—			
No. 1	2.00	@	2.15
No. 2	1.90	@	2.00
No. 3	1.25	@	1.35
No. 4	1.10	@	1.20
No. 5A	1.10	@	1.15
B	1.05	@	1.10
C	1.00	@	1.05

TORONTO

Paper

(Mill Prices to Jobbers f. o. b. Mill)

Bond—			
Sulphite	.10½	@	.12½
Light tinted.....	.11	@	.13¼
Dark tinted.....	.12½	@	.15
Ledgers (sulphite)..	—	@	.13
Ledgers No. 1.....	.16	@	—
Ledgers No. 2.....	.27	@	—
Writing	.09½	@	
Writing S C.....	.10	@	
News f. o. b. Mills—			
Rolls (carloads)..	3.50	@	—
Sheets (carloads).	—	@	4.25
Sheets (2 tons or over).....	—	@	4.60
Book—			
No. 1 M. F. (carloads)	8.00	@	—
No. 2 M. F. (carloads)	7.50	@	—
No. 3 M. F. (carloads)	7.00	@	—
No. 1 S. C. (carloads)	8.50	@	—
No. 2 S. C. (carloads)	8.00	@	—
No. 3 S. C. (carloads)	7.50	@	—
No. 1 Coated and litho 14.50		@	—
No. 2 Coated and litho 13.50		@	—
No. 3 Coated and litho 12.75		@	—
Coated tinted	.15	@	—
Wrapping—			
Rag Brown	4.75	@	—
White Rap	5.25	@	—
"P" Manila	5.50	@	—
No. 1 Manila....	6.50	@	—
Fiber	6.50	@	—
Kraft, M. F.....	7.00	@	—
M. G.	7.15	@	—

Pulp

(F. o. b. Mill)

Ground wood.....	29.00	@	30.00
Sulphite easy bleaching	60.00	@	65.00
Sulphite news grade	55.00	@	58.00
Sulphite, bleached.	75.00	@	80.00
Sulphate 62.50		@	65.00

Old Waste Paper

(In carload lots, f. o. b. Toronto)

Shavings—			
White Env. Cut..	3.60	@	—
Soft White Book shavings	—	@	3.25
White Blk, News.	1.70	@	—
Book and Ledger—			
Flat Magazine and Book Stock (old)	1.25	@	—
Light and Crumpled Book Stock	1.10	@	—
Ledgers and Writings	1.40	@	—
Solid Ledgers....	1.40	@	—
Manilas—			
New Manila Cut.	—	@	1.60
Printed Manilas..	1.00	@	—
Kraft	2.10	@	2.10
News and Scrap—			
Strictly Overissue	.80	@	—
Folded News....	.80	@	—
No. 1 Mixed Papers	.55	@	—
Domestic Rags—			
Price to mills, f. o. b. Toronto		Per lb.	
No. 1 White shirt cuttings	.14½	@	.14¾
No. 2 White shirt cuttings	.08	@	.08½
Fancy shirt cuttings	.09¼	@	.10
No. 1 Old Whites..	—	@	—
Third and blues....	.05¼	@	.05½